US006257574B1

(12) **United States Patent**
Evans

(10) **Patent No.: US 6,257,574 B1**
(45) **Date of Patent: Jul. 10, 2001**

(54) MULTI-POLYHEDRAL PUZZLES

(76) Inventor: **Harriet S. Evans**, 2174 N. Cross Dr., Shreveport, LA (US) 71107

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/370,929**

(22) Filed: **Aug. 5, 1999**

Related U.S. Application Data

(60) Provisional application No. 60/104,666, filed on Oct. 16, 1998.

(51) **Int. Cl.**[7] **A63F 9/08**
(52) **U.S. Cl.** ..... **273/157 R**
(58) **Field of Search** ..... 273/157 R, 156, 273/153 R, 160

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,471,943	*	10/1923	Chambers	273/157 R
2,041,030	*	5/1936	Sutton	273/157 R
2,216,915	*	10/1940	Johnson	273/157 R
2,839,841	*	6/1958	Berry	273/157 R
3,637,216		1/1972	Keister	273/156
3,645,535	*	2/1972	Randolph	273/157 R
3,655,201		4/1972	Nichols	273/153 R
3,659,360	*	5/1972	Zeischegg	273/157 R
3,712,622	*	1/1973	Odier	273/157 R
4,258,479		3/1981	Roane .	
5,108,100	*	4/1992	Essebaggers et al.	273/157 R
5,338,034		8/1994	Asch	273/155
5,344,148		9/1994	Asch	273/156
5,407,201		4/1995	Whitehurst	273/157 R
5,660,387	*	8/1997	Stokes	273/157 R

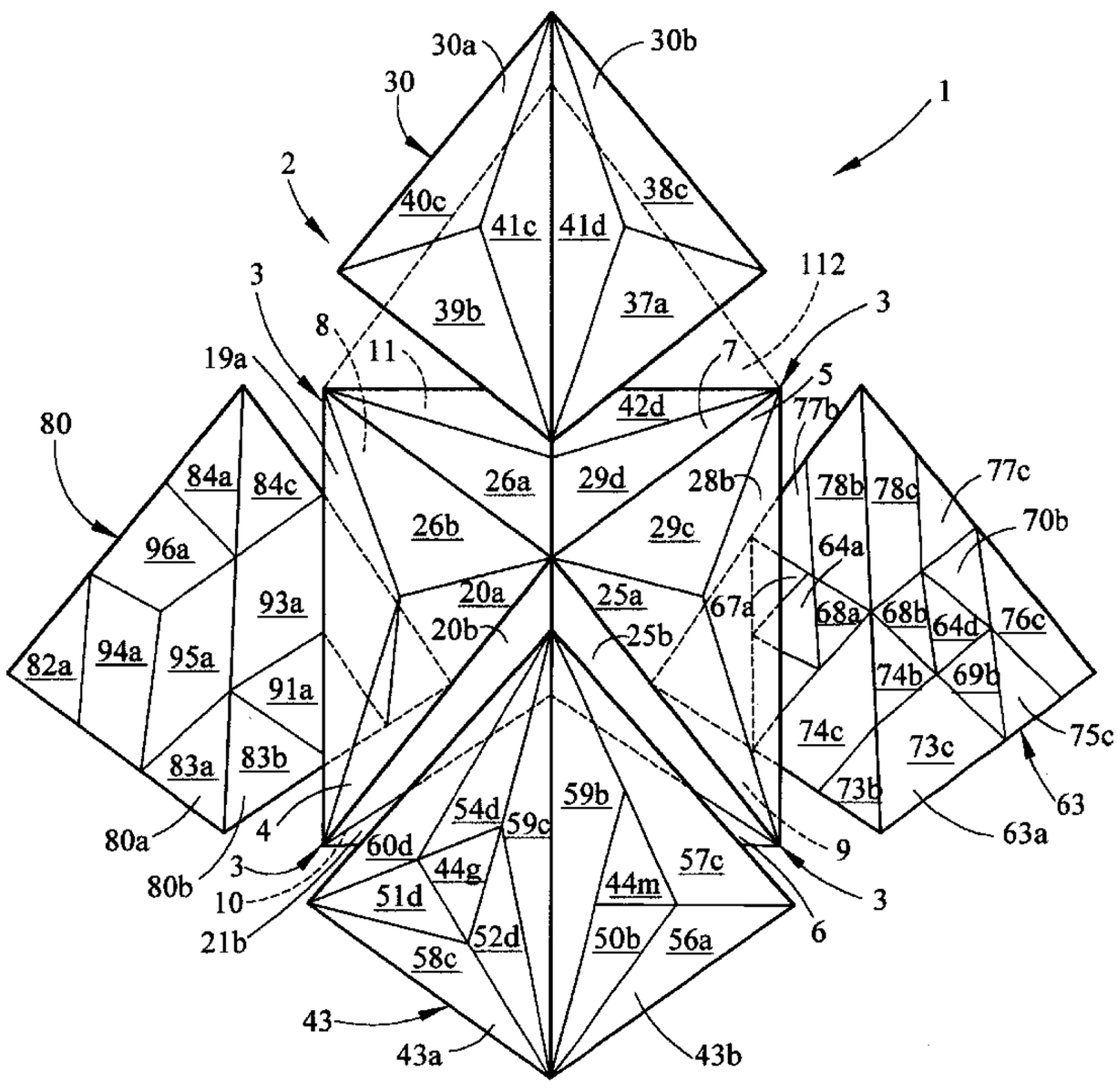
* cited by examiner

Primary Examiner—Steven Wong
(74) *Attorney, Agent, or Firm*—John M Harrison

(57) ABSTRACT

Multi-polyhedral puzzles characterized by four tetrahedra and one octahedron which are divided into different sets of multiple polyhedron blocks having various configurations, each block having multiple faces and each face being one of several colors. In a preferred embodiment the polyhedron blocks of each octahedron or tetrahedron set are fitted together in a corresponding transparent case to form the octahedron or tetrahedron, according to one of three levels of difficulty. At the most advanced level of difficulty in assembling each octahedron and tetrahedron, the polyhedron blocks of each set are fitted together such that abutting faces of adjacent polyhedron blocks match in color and a prescribed color pattern is formed on the respective faces of the assembled octahedron or tetrahedron. At an intermediate level of difficulty, the polyhedron blocks are fitted together to form the prescribed color pattern on the faces of the assembled octahedron or tetrahedron without regard to matching colors of abutting polyhedron block faces. At an elementary level of difficulty, the polyhedron blocks are fitted together to form the corresponding octahedron or tetrahedron without regard to matching colors of abutting polyhedron block faces or formation of the prescribed color pattern on the faces of the assembled octahedron or tetrahedron. The assembled tetrahedra can be arranged on respective faces of the assembled octahedron to form a large tetrahedron, for packaging or storage purposes.

9 Claims, 17 Drawing Sheets



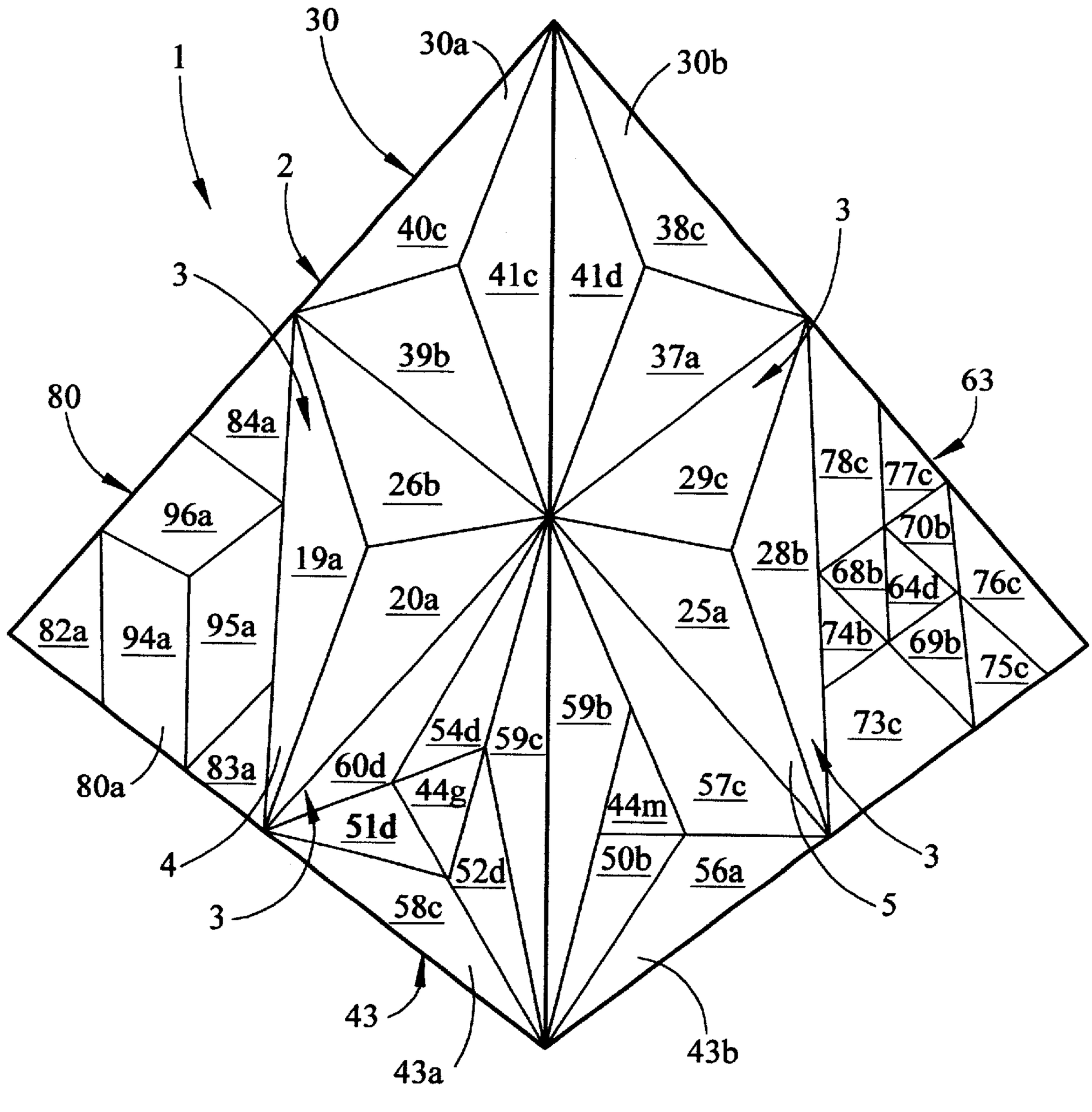

30
30a
30b
1
2
3
40c
38c
41c
41d
39b
37a
80
84a
26b
29c
78c
77c
63
96a
19a
28b
70b
68b
64d
76c
20a
25a
82a
94a
95a
74b
69b
75c
59b
54d
59c
73c
60d
83a
80a
44g
57c
44m
51d
4
52d
50b
56a
3
5
58c
43
43a
43b

FIG. 1

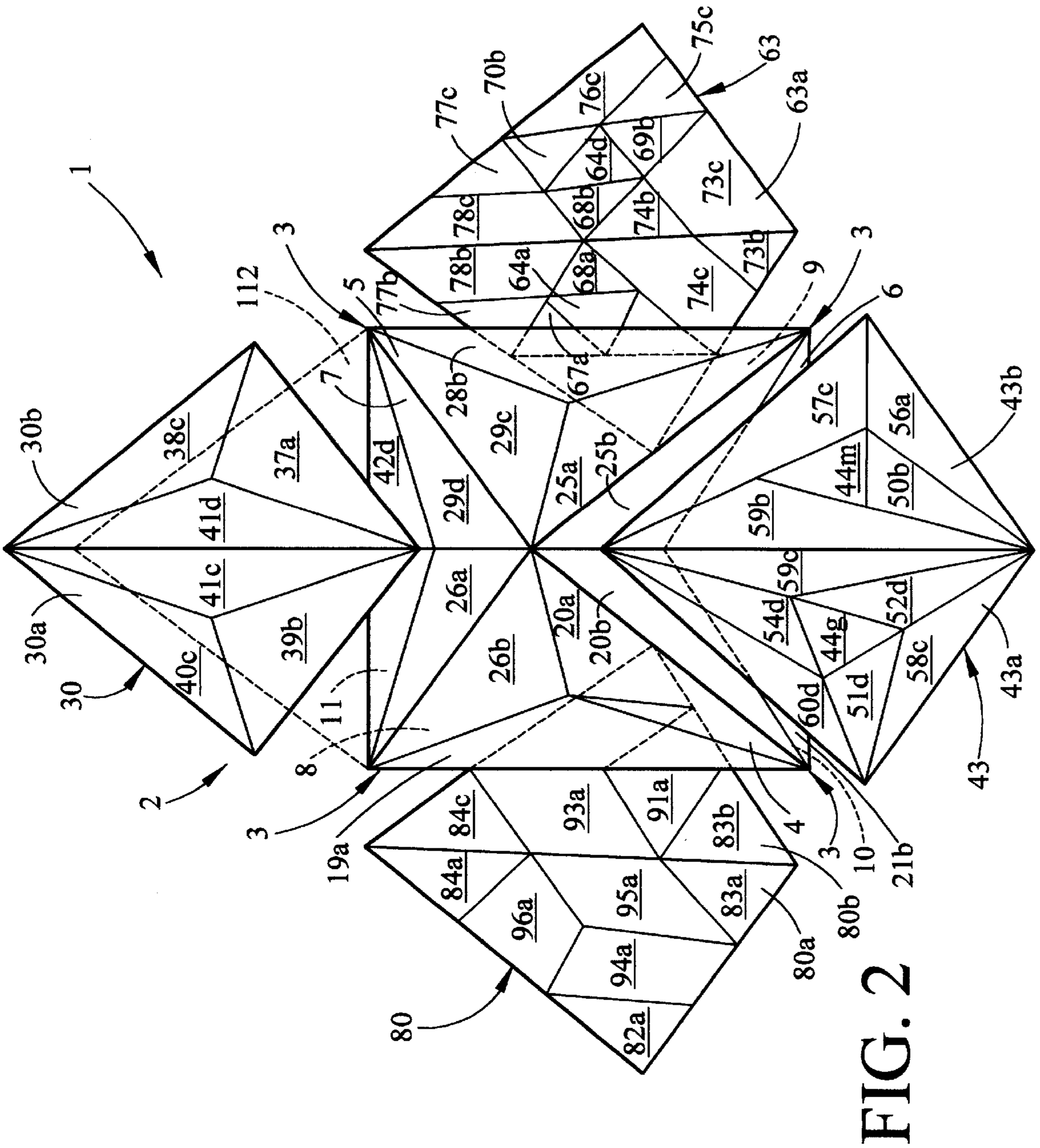

1
2
3
4
5
6
7
8
9
10
11
112
19a
21b
30
30a
30b
38c
37a
41d
41c
40c
39b
42d
29c
29d
28b
25a
25b
26a
26b
20a
20b
57c
56a
44m
50b
59b
59c
54d
52d
44g
58c
60d
51d
43
43a
43b
63
63a
75
70b
77c
76c
64d
69b
73c
68b
74b
78d
64a
68a
74c
73b
78b
77b
67d
80
84c
84a
96a
94a
82a
93a
91a
83b
95a
83a
80a
80b

FIG. 2

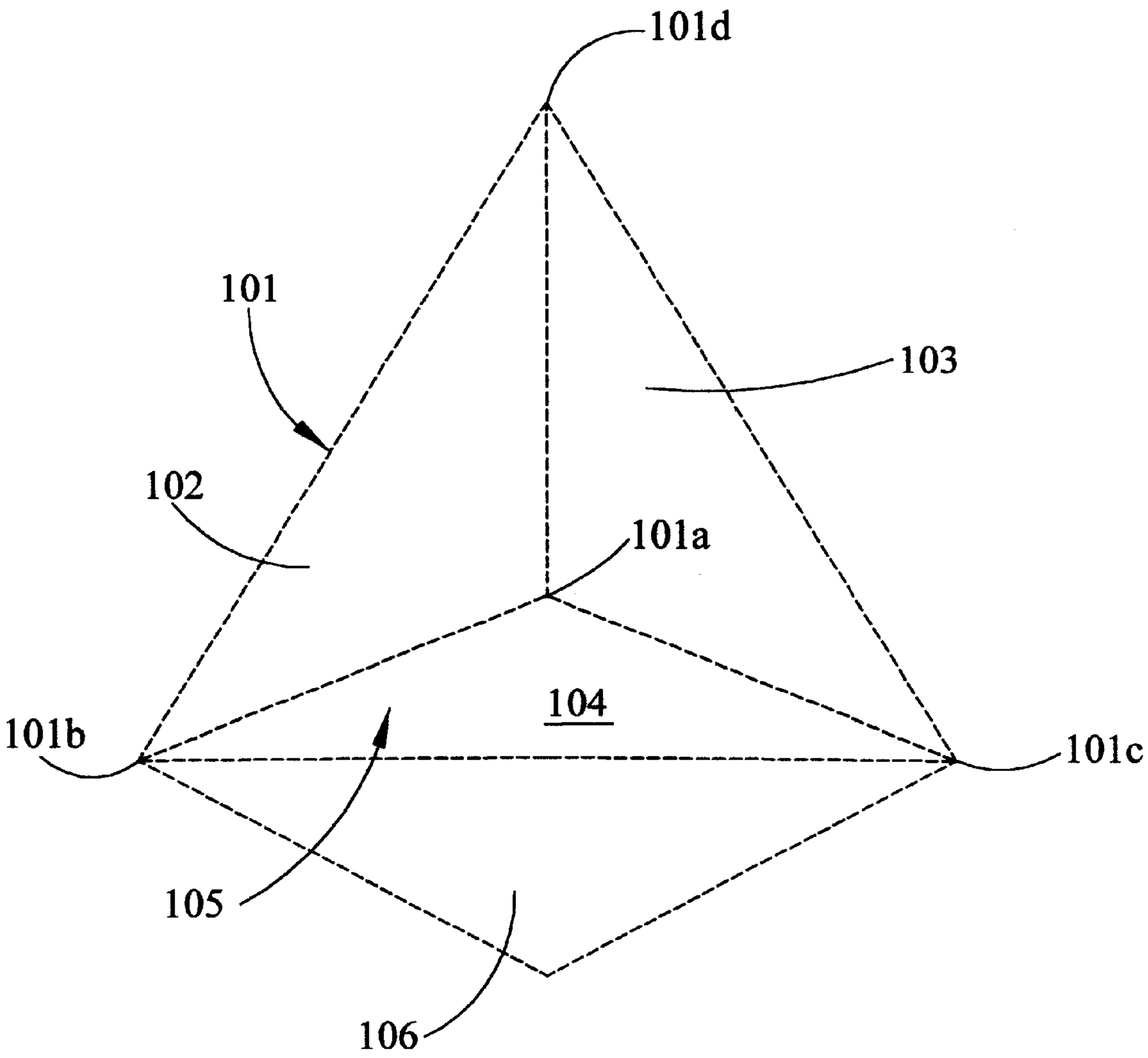


FIG. 3

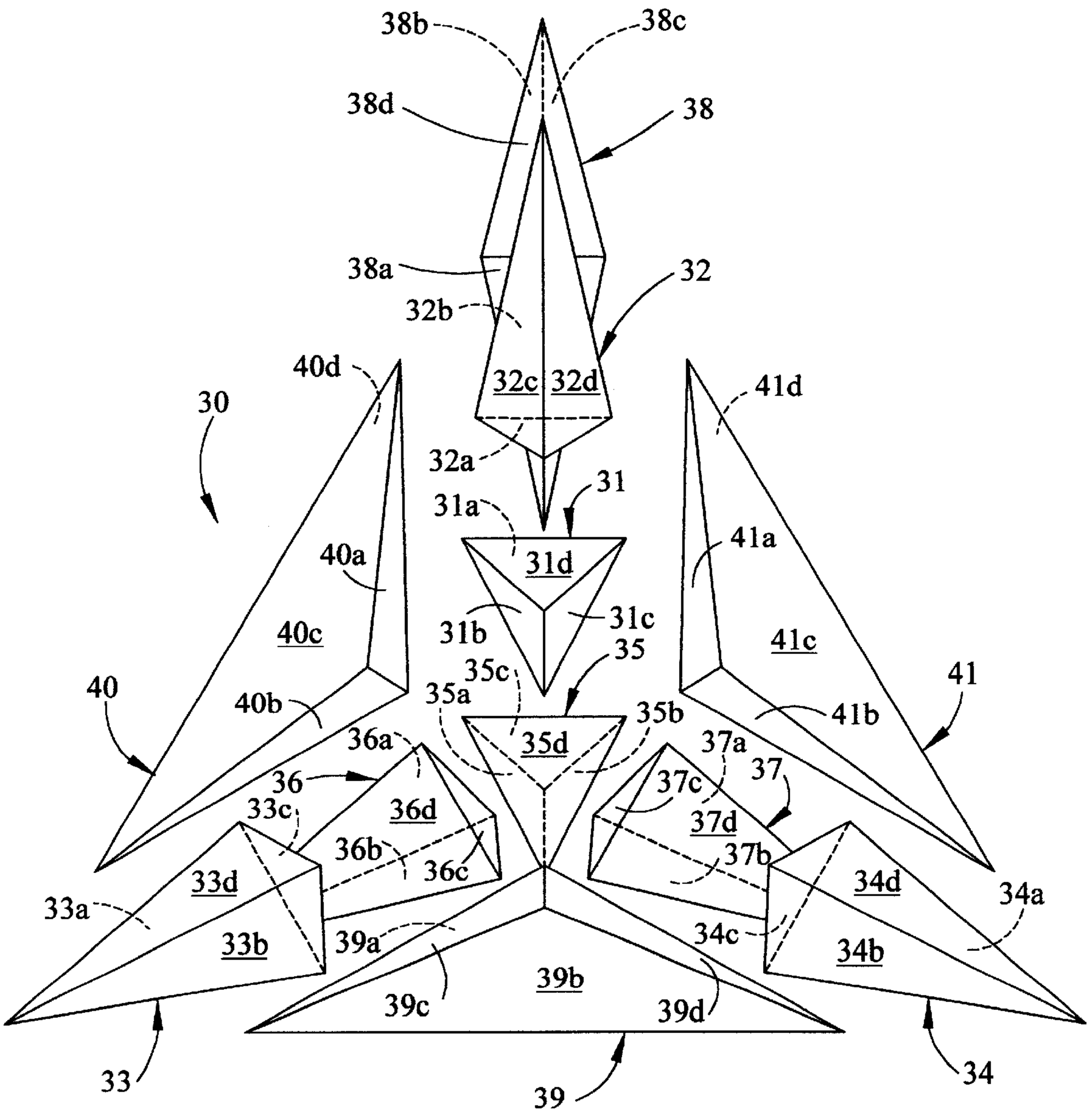

38b
38c
38d
38
38a
32
32b
32c
32d
40d
41d
30
32a
31
31a
41a
40a
31d
40c
31b
31c
41c
35
35c
41
40
40b
35a
35b
41b
35d
36a
37a
36
37c
37
33c
36d
37d
36b
37b
34d
34a
33d
36c
33a
34c
39a
33b
34b
39b
39c
39d
33
39
34

FIG. 4

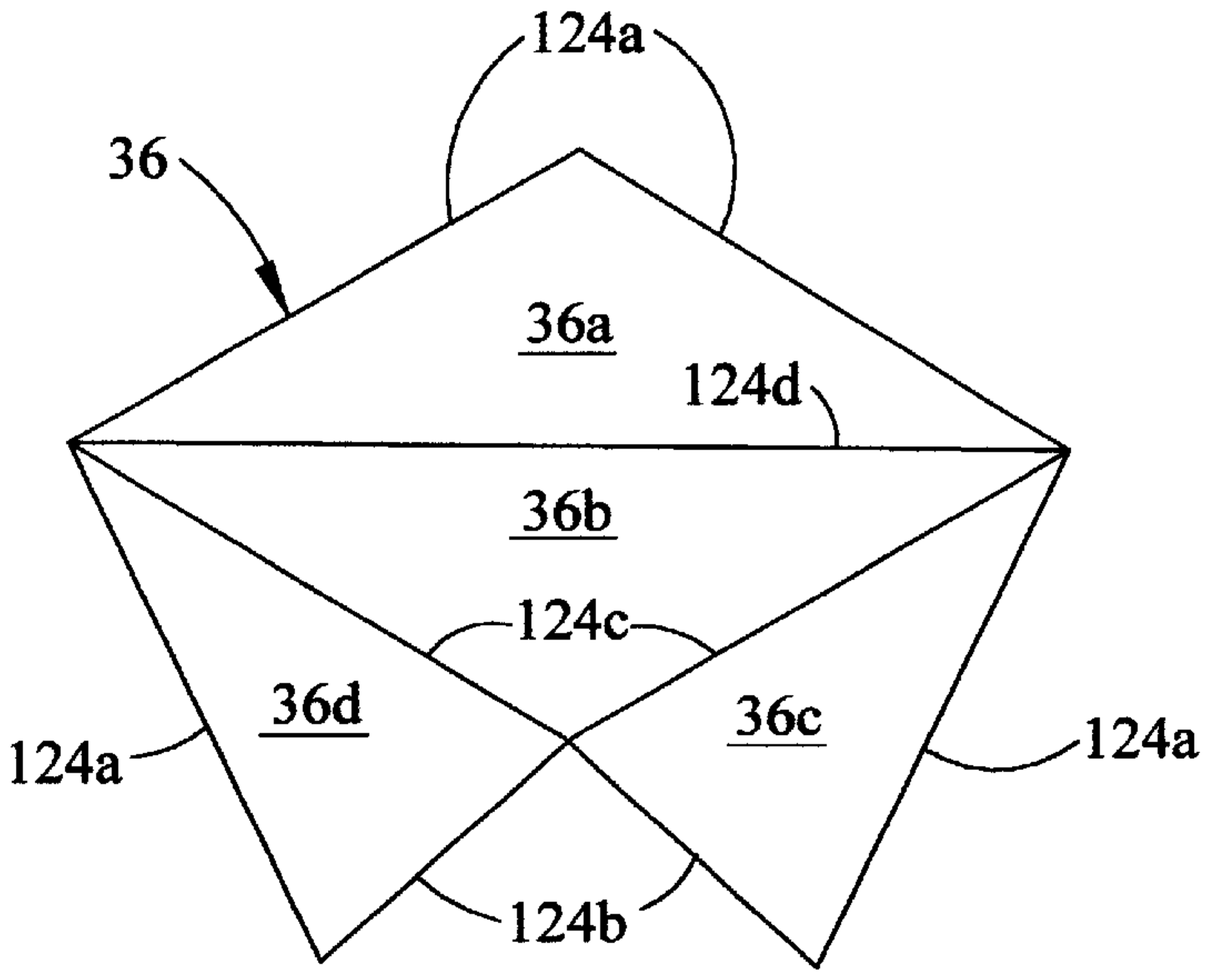


FIG. 4A

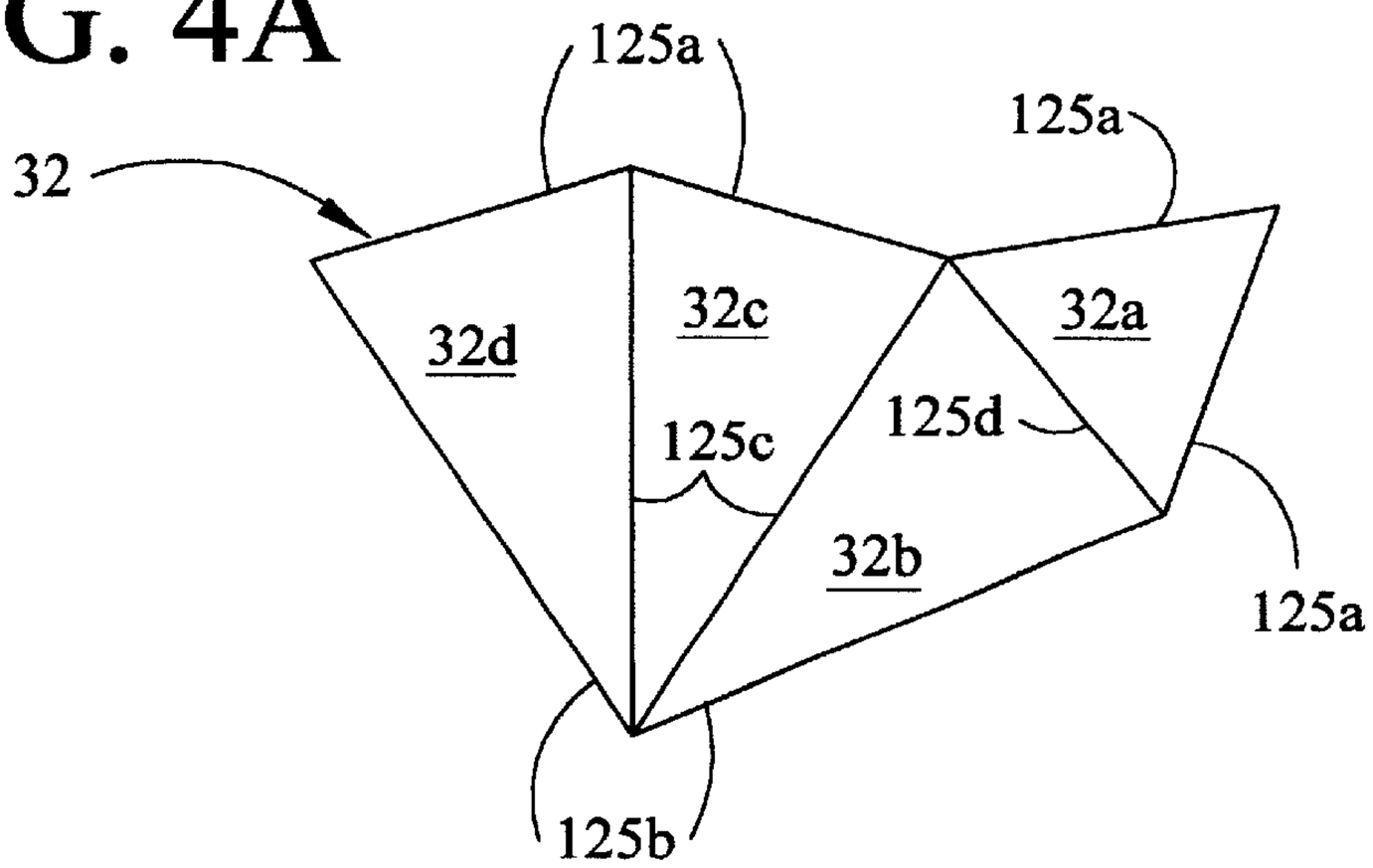
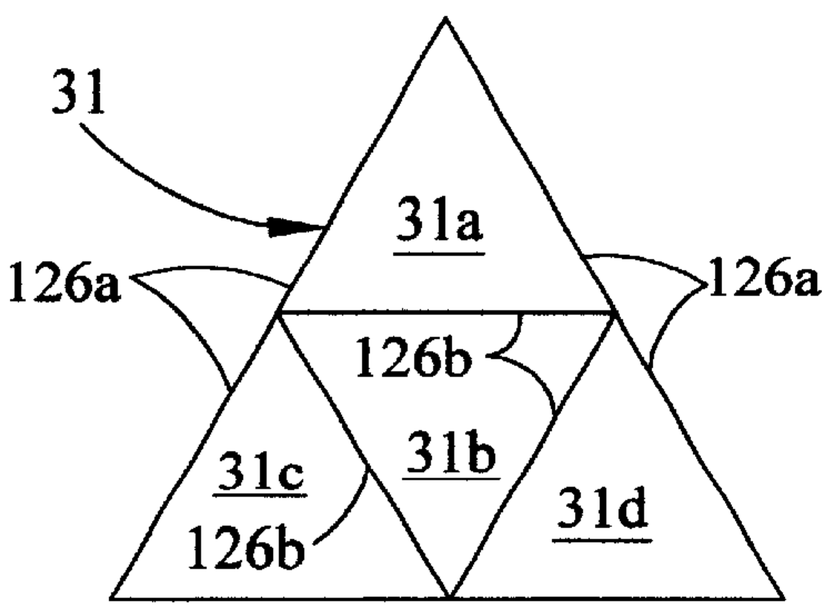


FIG. 4B



126a

FIG. 4C

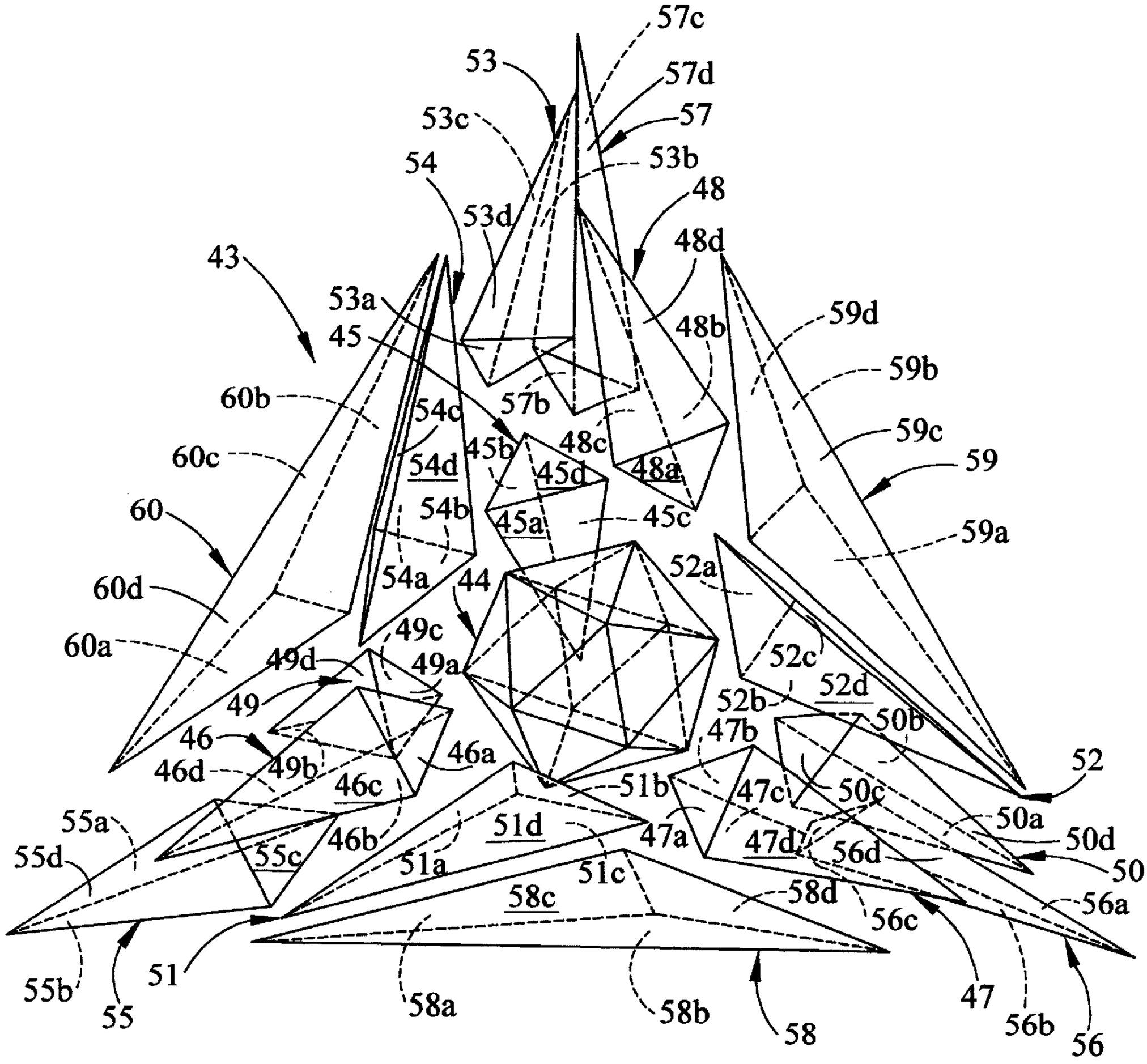

57c
53
57d
53c
57
54
53b
48
53d
48d
43
53a
45
59d
48b
59b
60b
54c
57b
59c
60c
45b
48c
54d
45d
48a
59
60
54b
45a
45c
59a
54a
44
52a
60d
49c
60a
49d
49a
52c
52d
49
52b
50b
46
47b
46a
46d
49b
52
46c
51b
47c
50c
55a
51d
47a
50a
55d
55c
46b
51a
47d
56d
50d
51c
50
58c
58d
56a
56c
55b
51
58a
58b
58
47
56b
55
56

FIG. 5

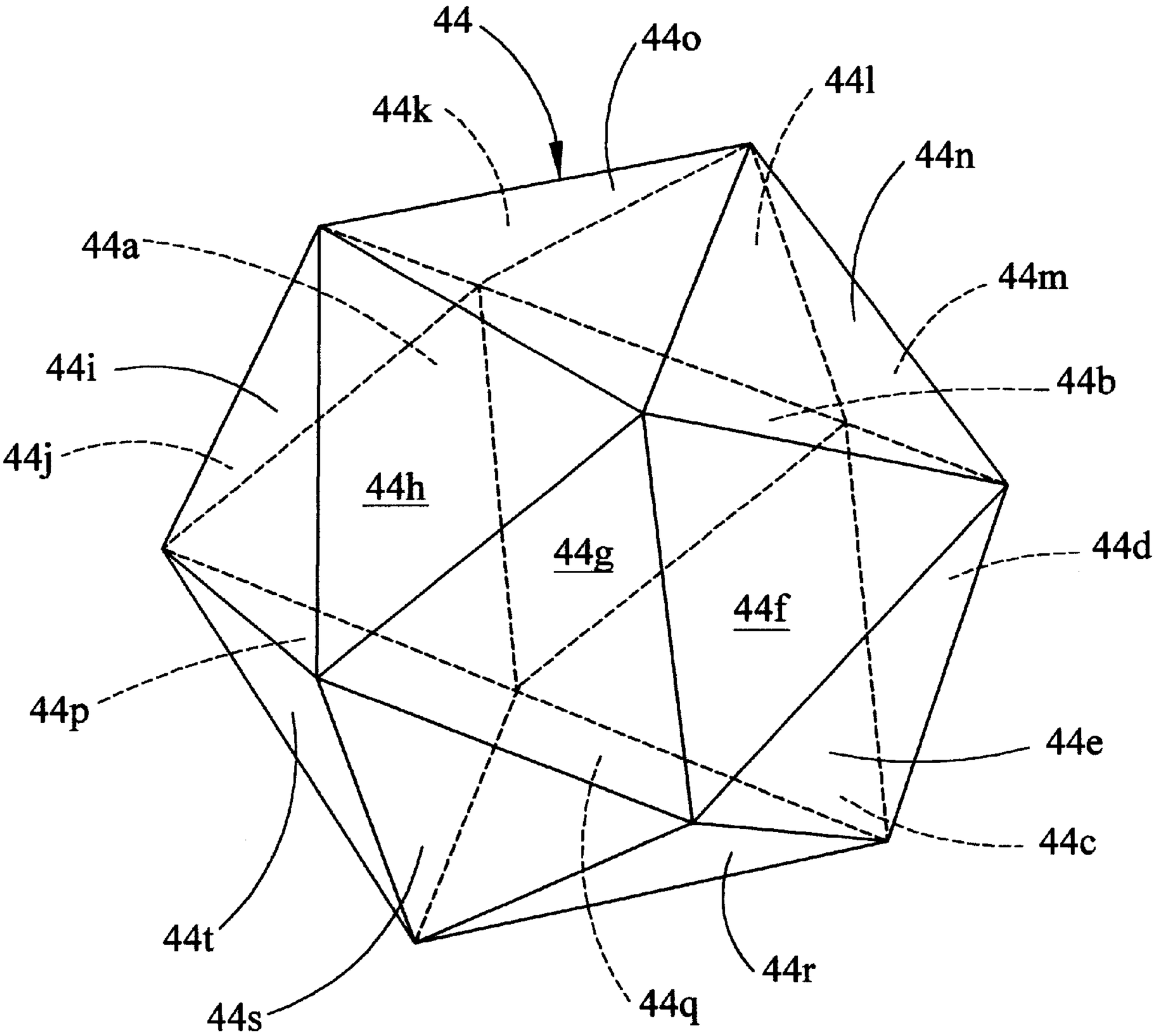

44
44o
44k
44l
44n
44a
44m
44i
44b
44j
44h
44g
44d
44f
44p
44e
44c
44t
44r
44s
44q

FIG. 5A

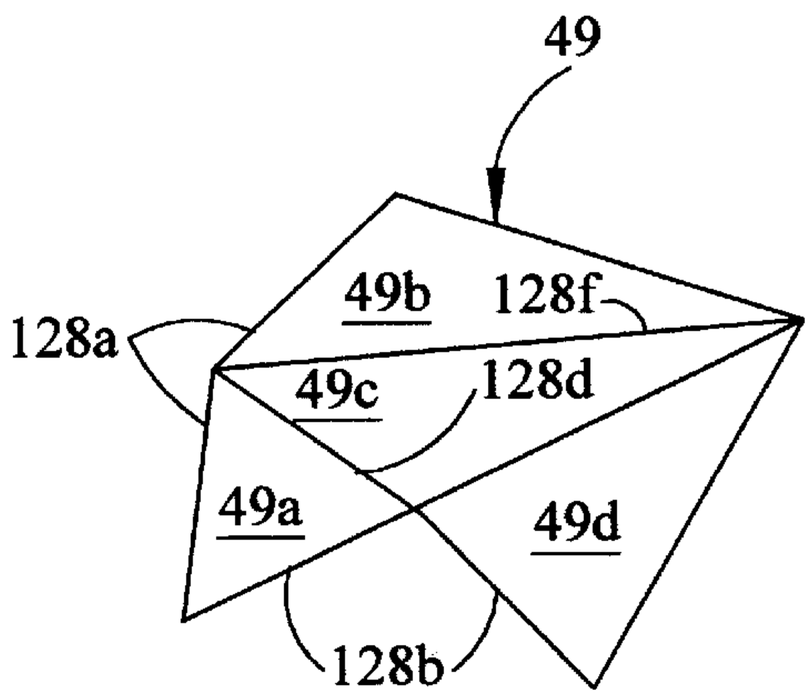


FIG. 5B

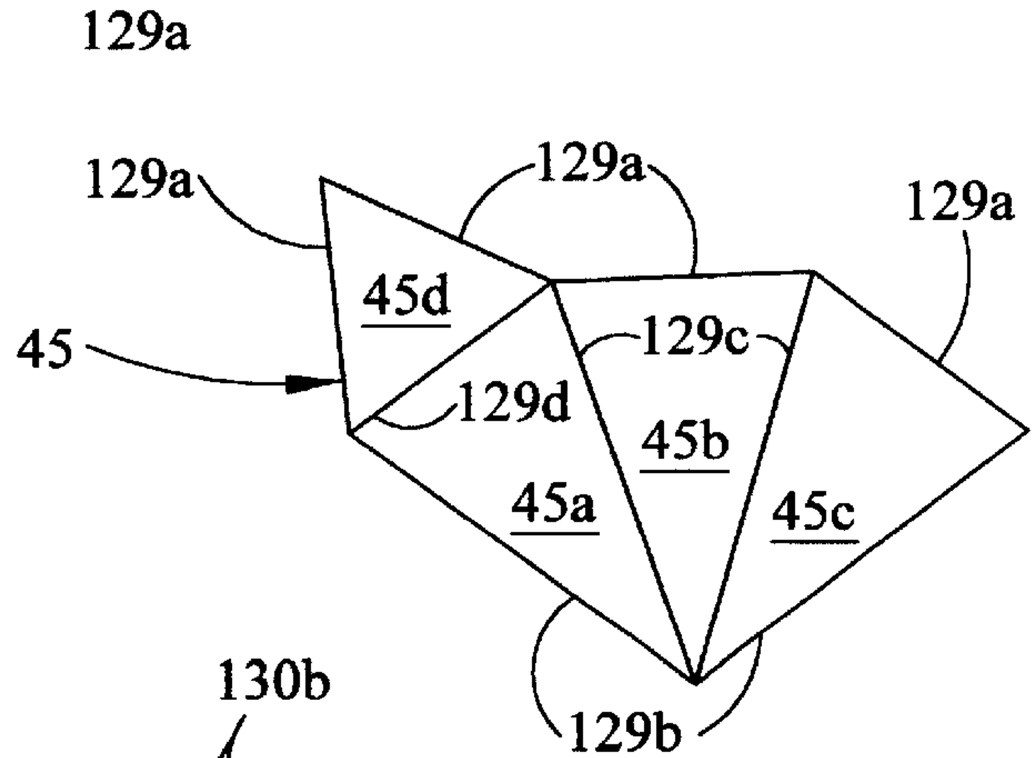


FIG. 5C

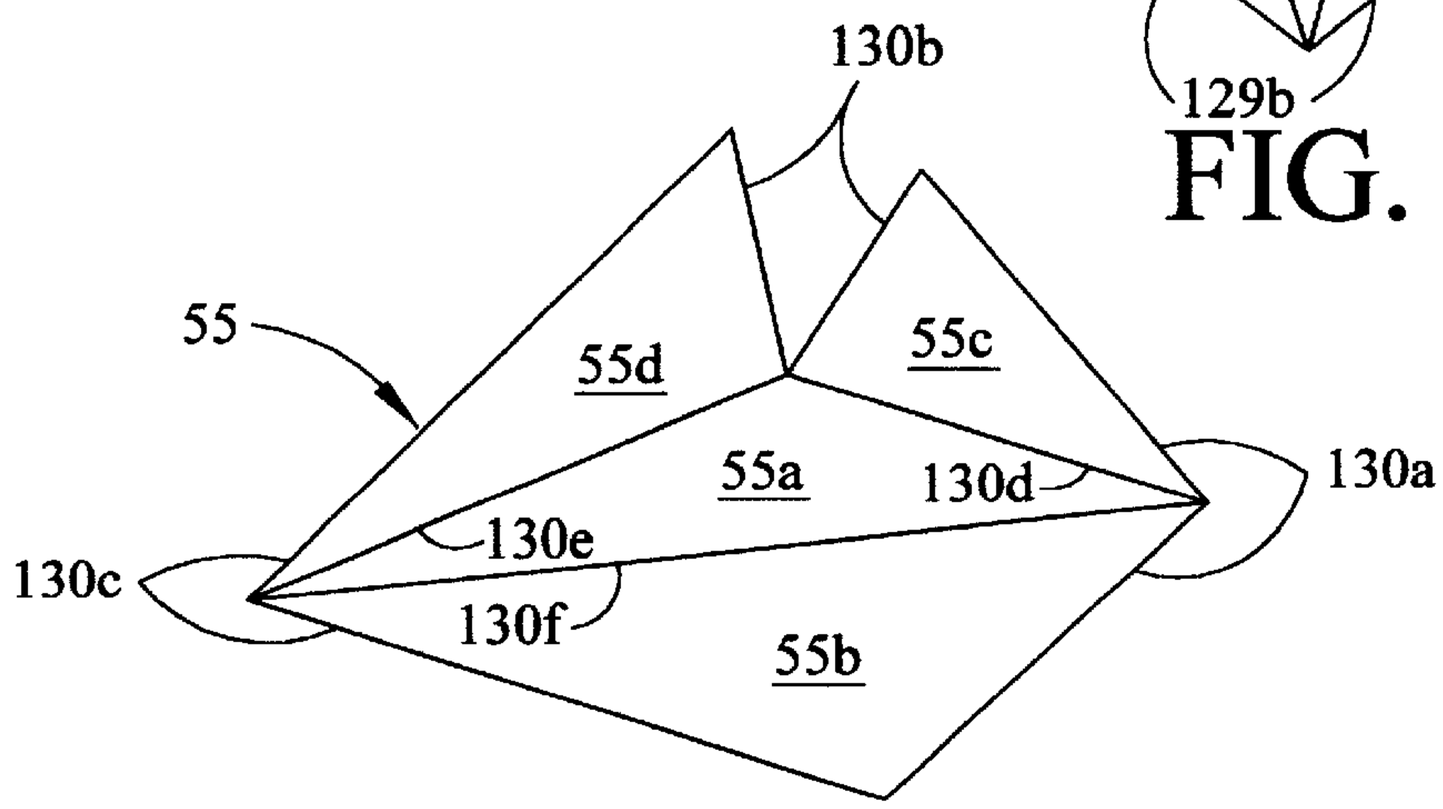


FIG. 5D

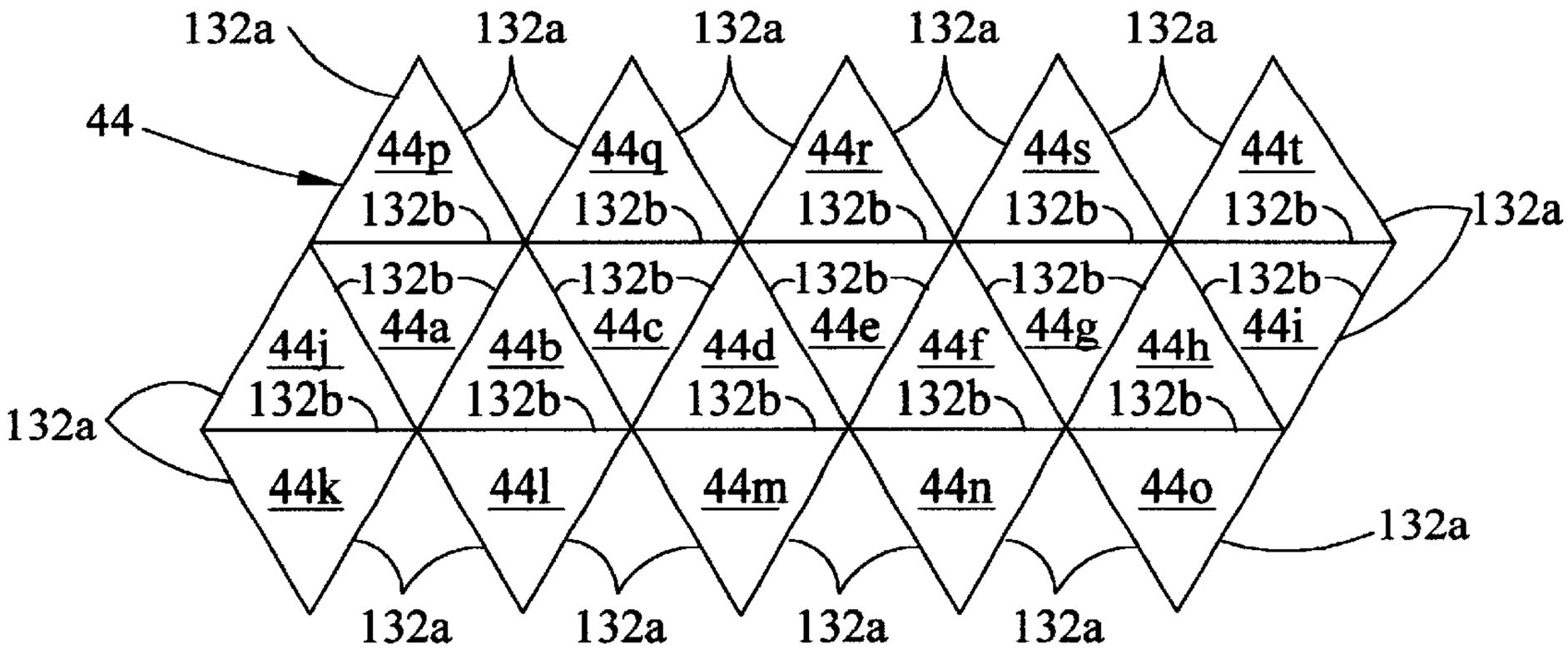


FIG. 5E

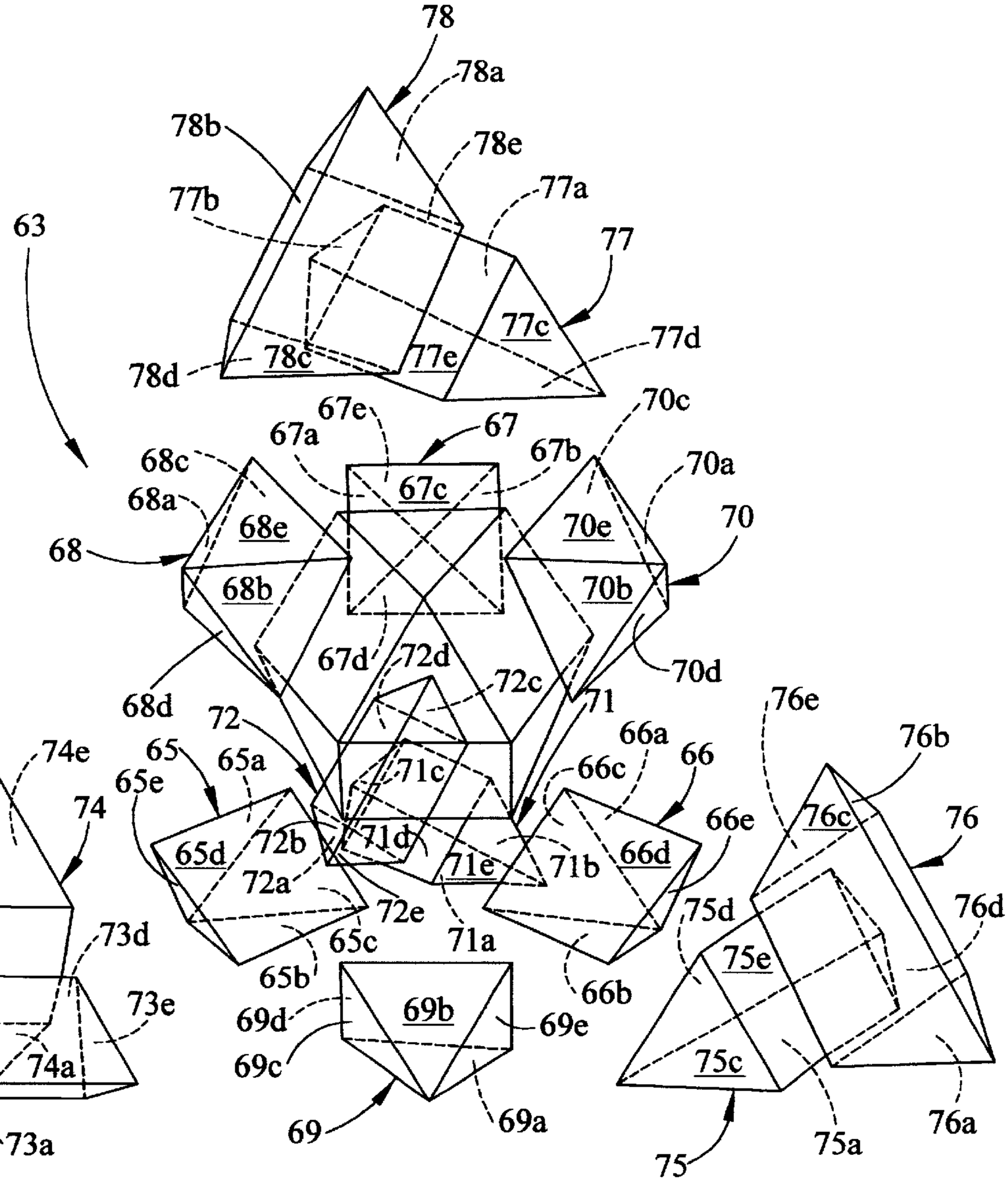

78
78a
78b
78e
77b
77a
63
77
77c
77d
78c
77e
78d
67e
67
70c
67a
67b
70a
68c
67c
68a
70
68e
70e
68
68b
70b
67d
72d
72c
70d
68d
72
71
76e
74c
74e
65
66a
76b
65a
66c
66
65e
74
71c
66e
76c
76
65d
72b
71d
66d
74b
72a
71e
71b
75d
76d
72e
73
74d
73d
65c
71a
75e
65b
66b
73e
69d
69b
69e
73c
74a
69c
75c
69
69a
73b
73a
75
75a
76a

FIG. 6

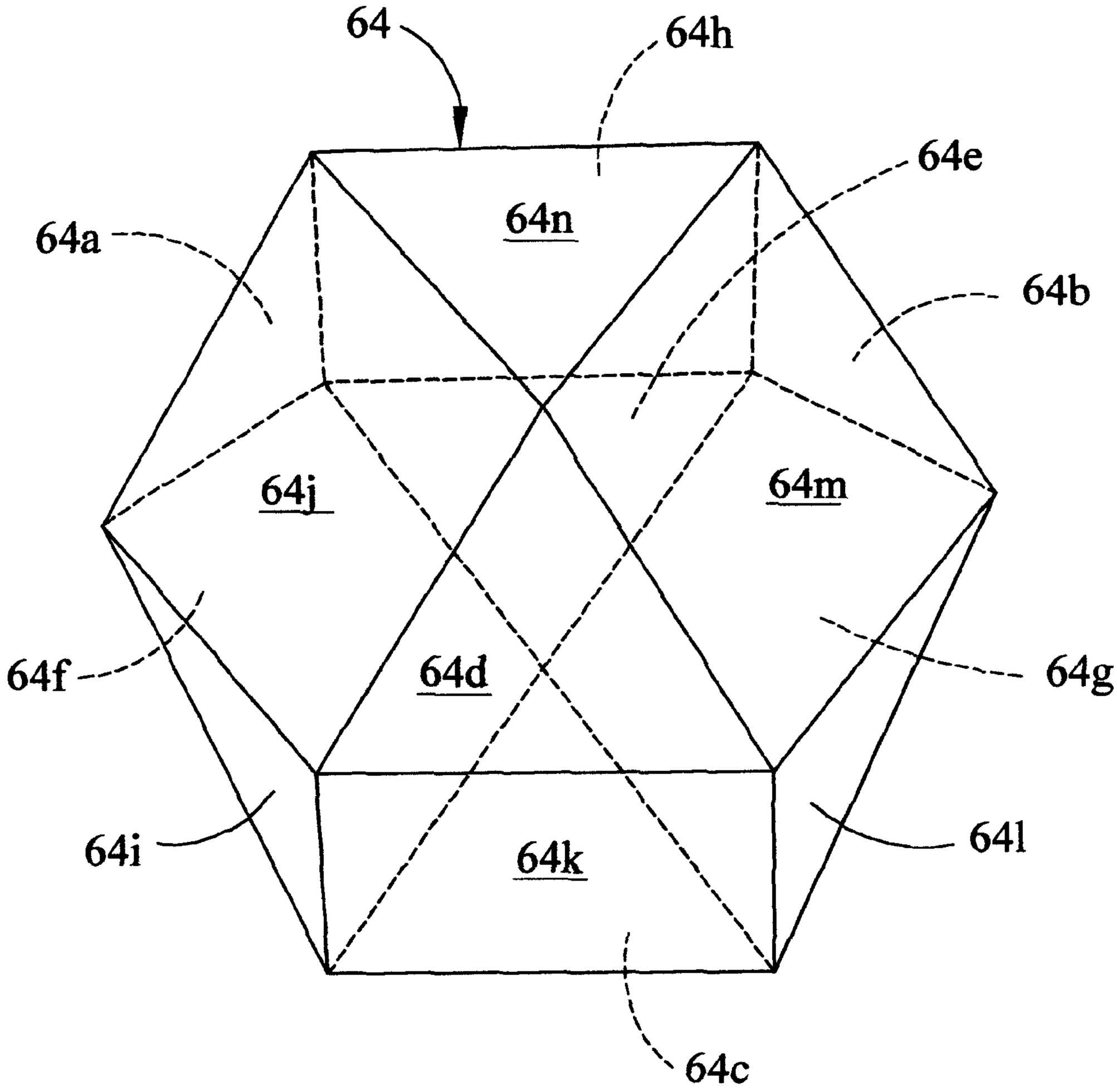


FIG. 6A

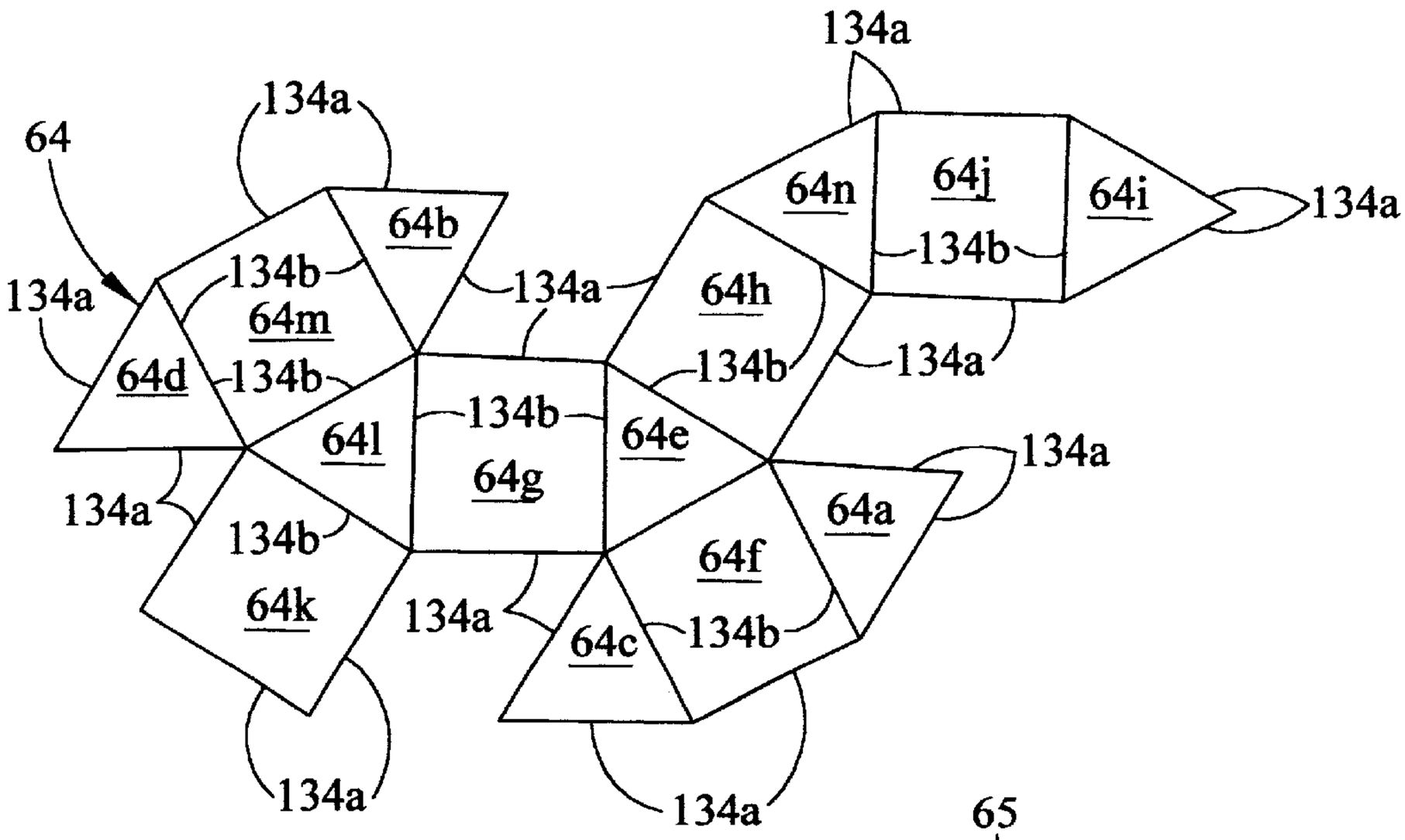


FIG. 6B

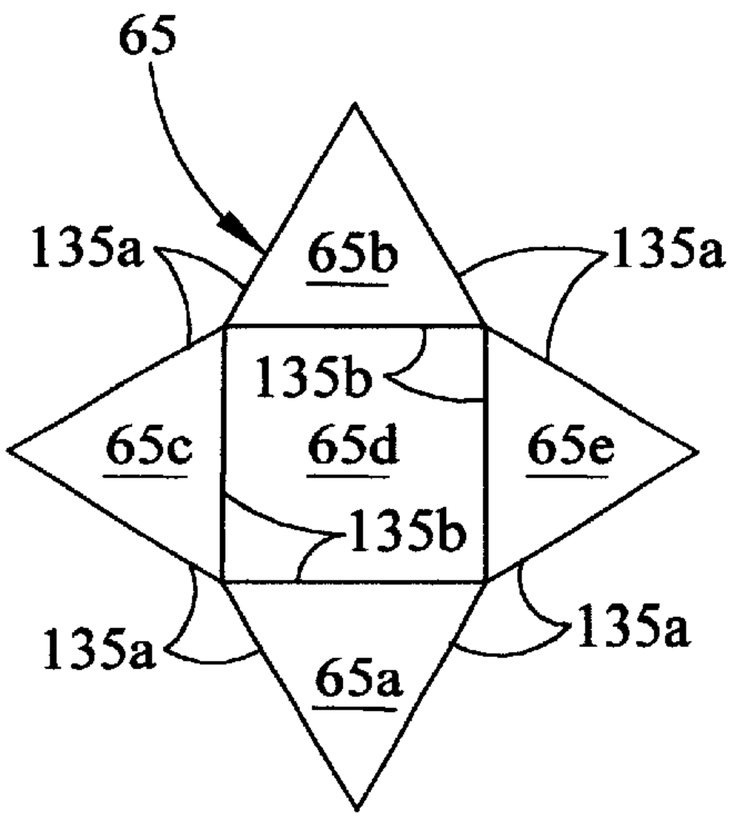


FIG. 6C

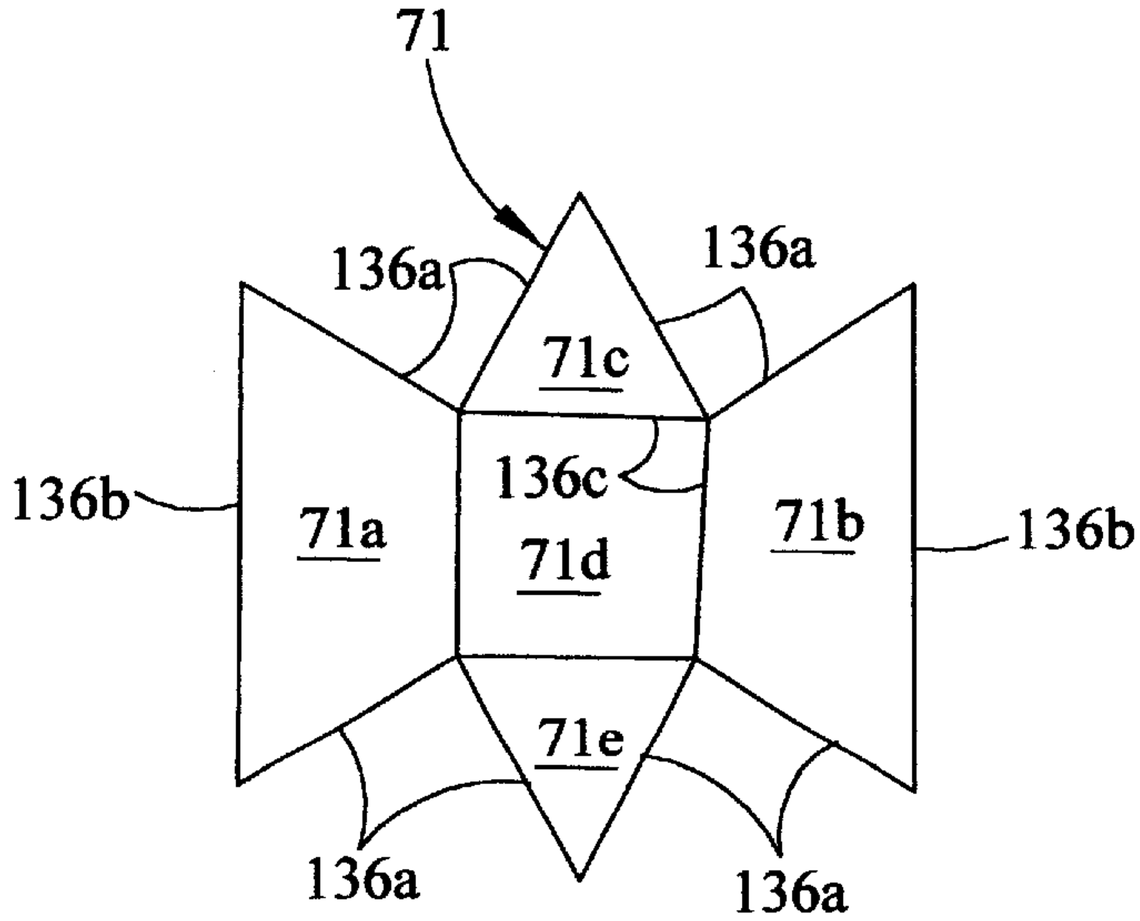


FIG. 6D

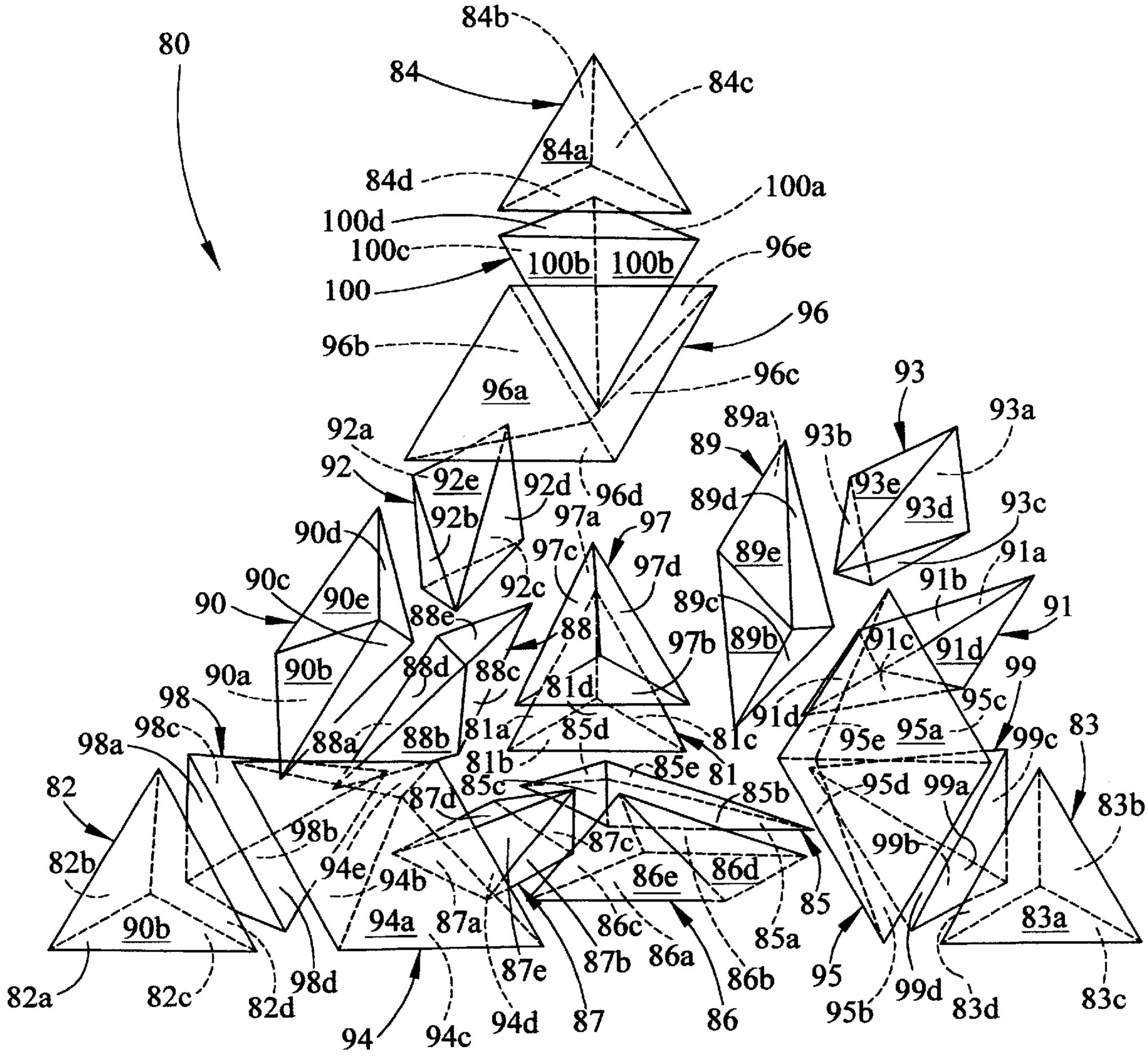

80
84
84b
84c
84a
84d
100a
100d
100c
100b
100b
100
96e
96
96b
96a
96c
92a
92
92e
92d
96d
92b
97a
97
90d
97c
97d
89a
89
93
93a
93b
89d
93e
93d
93c
89e
91a
90c
90
90e
92c
88e
88
89c
91b
91
97b
89b
91c
91d
90a
90b
88d
88c
81d
99
98
95c
98c
98a
88a
88b
81a
85d
81c
91d
95e
95a
99c
83
81b
85e
81
85b
82
85c
87d
95d
99a
83b
98b
87c
99b
82b
94e
94b
86e
86d
85
90b
94a
87a
86c
85a
83a
87e
87b
86a
86b
95
82a
82c
98d
82d
94
94c
94d
87
86
95b
99d
83d
83c

FIG. 7

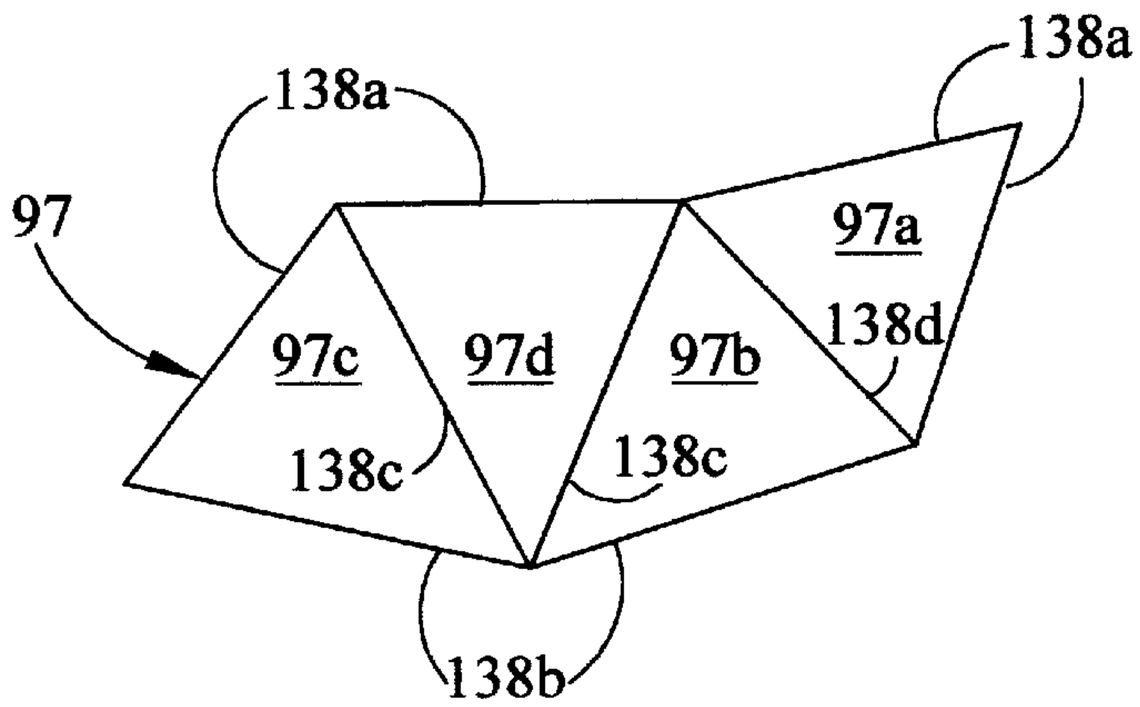


FIG. 7A

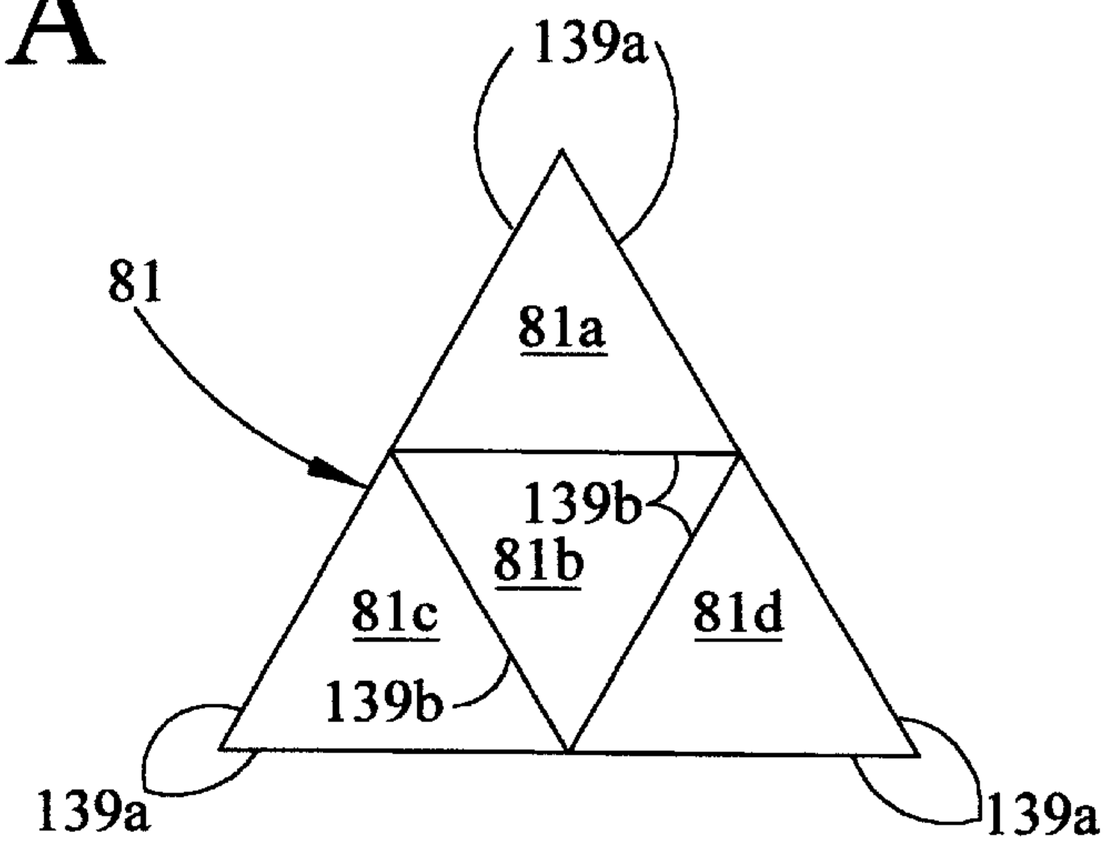


FIG. 7B

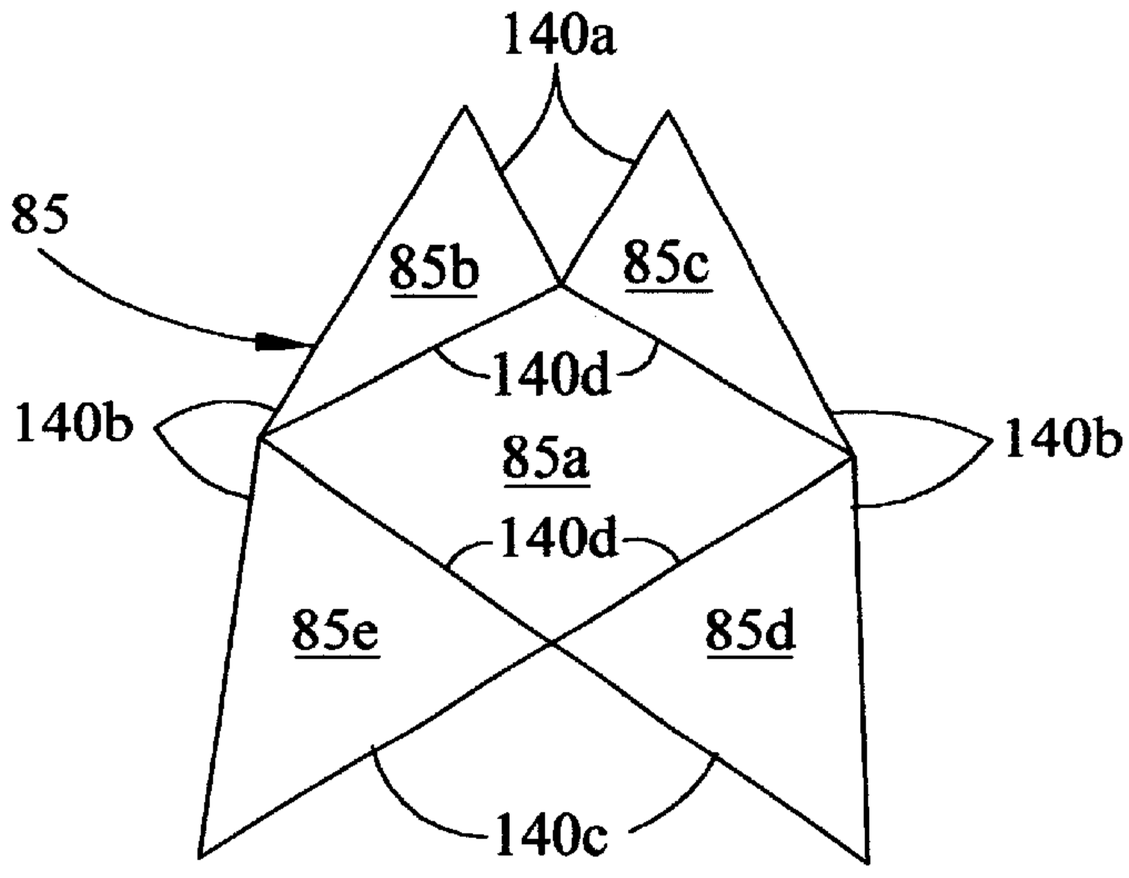


FIG. 7C

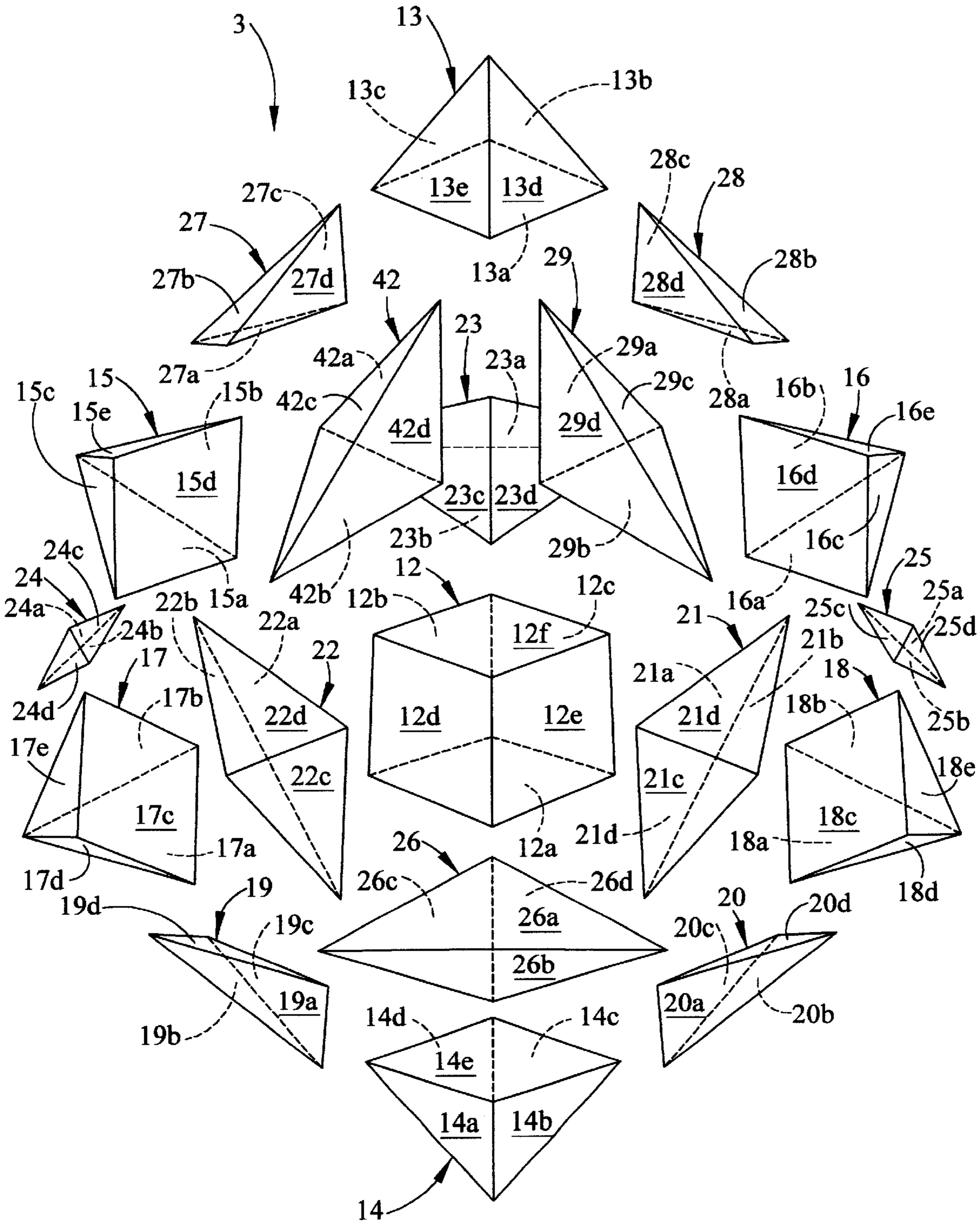

3
13
13c
13b
13e
13d
13a
27c
27
27b
27d
27a
28c
28
28b
28d
28a
42
42a
42c
42d
42b
23
23a
23c
23d
23b
29
29a
29c
29d
29b
15
15c
15e
15b
15d
16
16b
16e
16d
16c
24
24c
24a
24b
24d
22b
15a
22a
22
22d
22c
12
12b
12c
12f
12d
12e
12a
21
16a
21b
21a
21d
21c
25
25c
25a
25d
25b
17
17b
17e
17c
17a
17d
18
18b
18e
18c
18a
18d
19
19d
19c
19a
19b
26
26c
26d
26a
26b
20
20d
20c
20a
20b
14d
14c
14e
14a
14b
14

FIG. 8

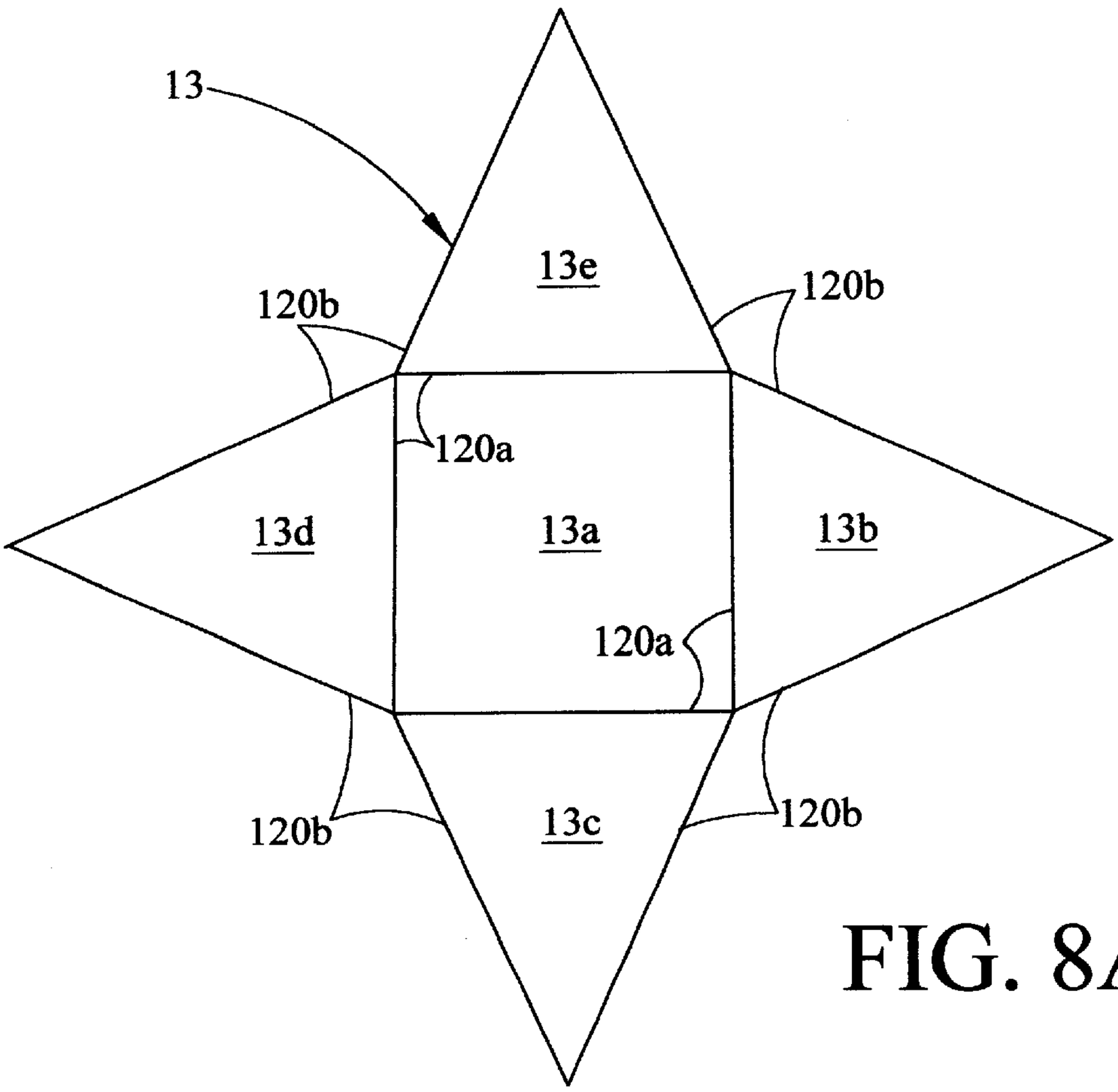

13
13e
120b
120b
120a
13d
13a
13b
120a
120b
13c
120b

FIG. 8A

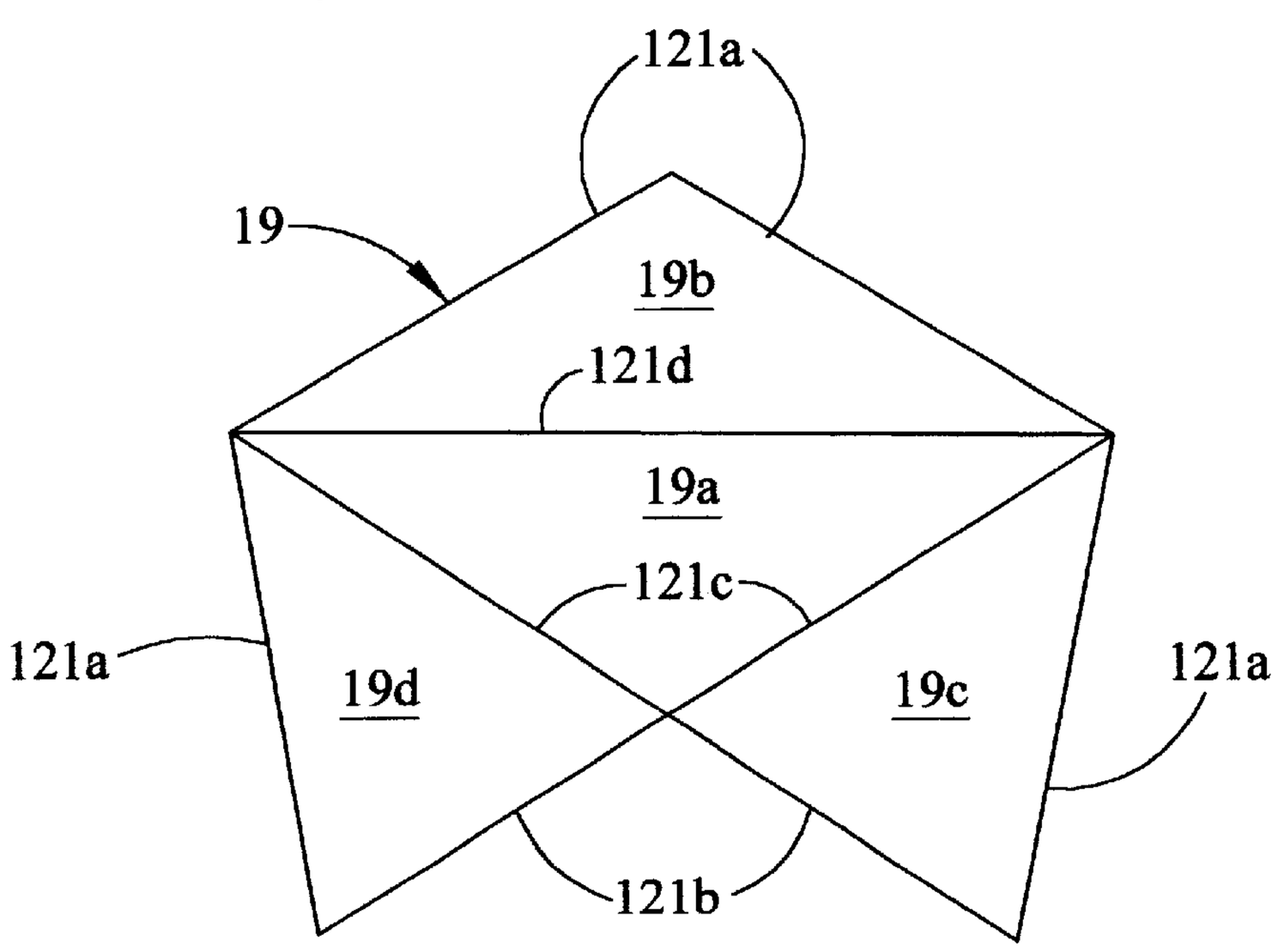

121a
19
19b
121d
19a
121c
121a
19d
19c
121a
121b

FIG. 8B

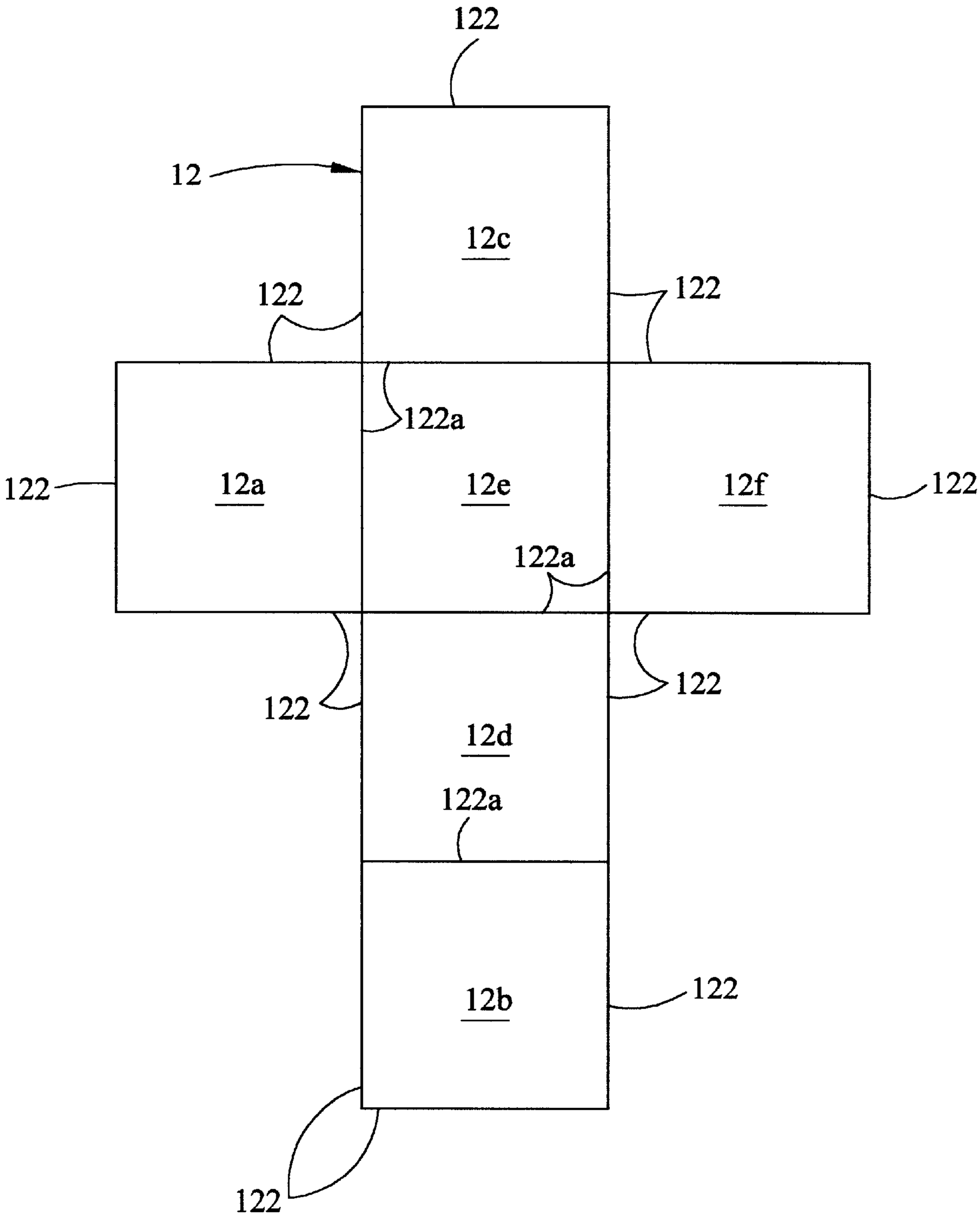

122
12
12c
122
122
122a
122
12a
12e
12f
122
122a
122
122
12d
122a
12b
122
122

FIG. 8C

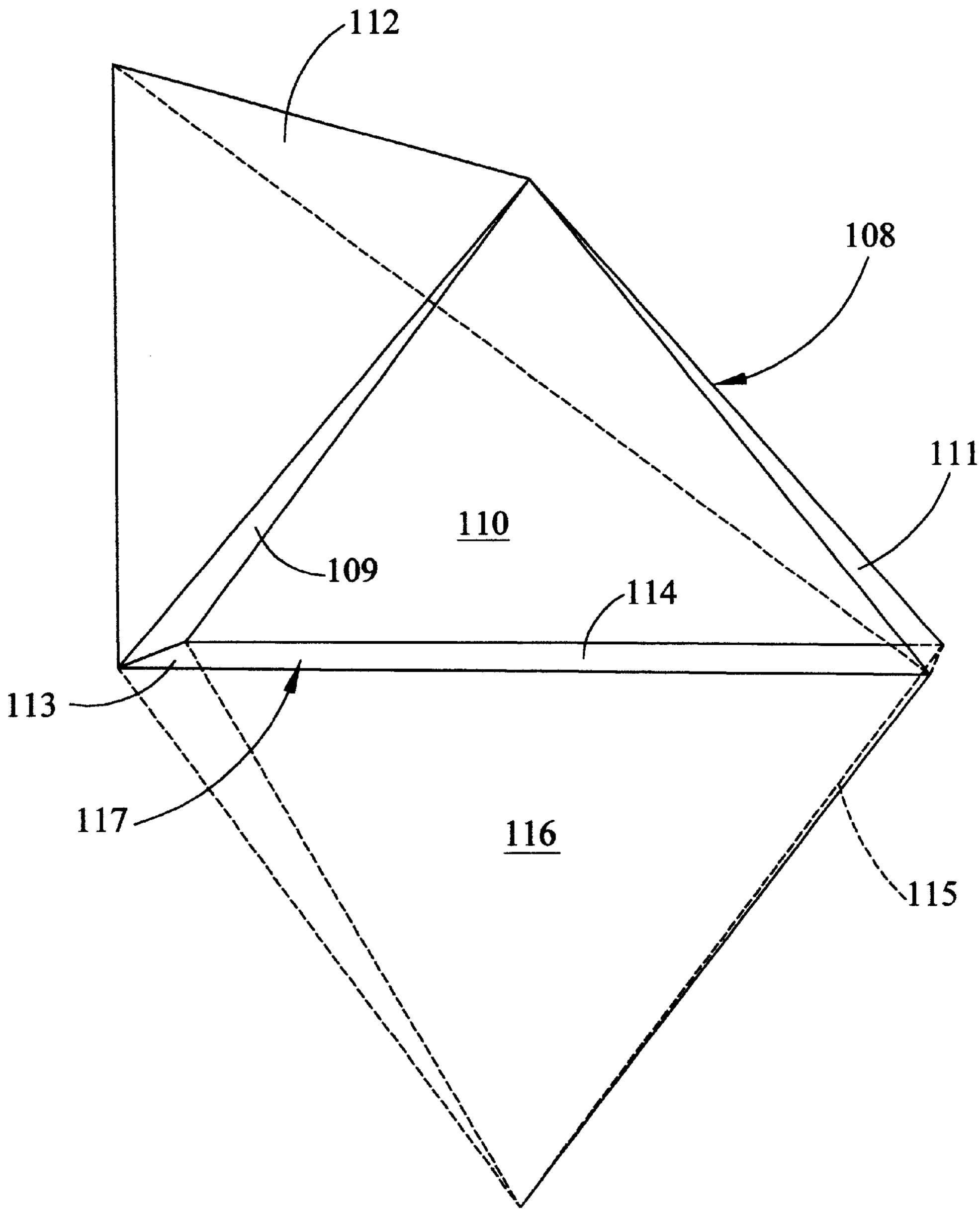


FIG. 9

MULTI-POLYHEDRAL PUZZLES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of copending U.S. Provisional Application Serial No. 60/104,666, filed Oct. 16, 1998.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to geometric puzzles and more particularly, to multi-polyhedral puzzles characterized by four tetrahedra and an octahedron which are divided into respective sets of multiple polyhedron blocks having various configurations, each face of each polyhedron block being one of multiple colors. In a preferred embodiment each octahedron or tetrahedron is divided into a set of polyhedron blocks which is different from the others. In solving the puzzles, each of the octahedron and four tetrahedra is assembled from the corresponding set of polyhedron blocks in an octahedron or tetrahedron-shaped transparent case, according to one of three levels of difficulty. At the most advanced level of difficulty, the octahedron and each of the tetrahedra are assembled from the polyhedron blocks such that abutting faces of adjacent polyhedron blocks match in color and a prescribed color pattern is formed on the respective faces of the octahedron or tetrahedron. At an intermediate level of difficulty, the polyhedron blocks are fitted together to form the prescribed color pattern on the faces of the assembled octahedron or tetrahedron, without regard to matching colors of abutting polyhedron block faces. At the elementary level of difficulty, each of the octahedron and tetrahedra is assembled from the polyhedron blocks irrespective of matching colors of abutting faces on adjacent polyhedron blocks and color pattern formation on the respective faces of the assembled octahedron or tetrahedron. The assembled tetrahedra can be arranged on respective faces of the assembled octahedron to form a large tetrahedron, for storage or packaging purposes.

2. Description of the Prior Art

Puzzles have entertained and amused mankind for centuries. In some cases, puzzles have served as educational or instructional tools, in addition to entertainment. A variety of two-dimensional puzzles and games which aid in learning the relationships of similar designs on planar surfaces, are described in such books as "Mathematical Magic Show", by Martin Gardner (1978) and "Puzzles Old and New", by Lewis Hoffman (1893).

Three-dimensional puzzles which require the assembly of smaller three-dimensional structures into a final, larger structure are well known. Comprehensive books have been written which describe a variety of such puzzles, for example, "Puzzles Old and New- How To Make and Solve Them", by J. Slocum and J. Botermans. Most of the three-dimensional puzzles known in the art do not require that designs or indicia on the surfaces of puzzle components be matched in order to complete the puzzle, only that the pieces be assembled to form the final structure. An example of such a puzzle was described in 1970 by House of Games in Canada, which included a cubic puzzle including thirteen rectangular pieces having nine colors disposed on their surfaces. Solving the puzzle requires locating nine different colors on each exposed surface of the final cubic structure. U.S. Pat. No. 3,788,645, discloses a mathematical cube puzzle in which four separate cubes have on each of their edges, one of a set of three color patterns. The object of the

puzzle is to arrange the various cubes relative to one another such that the colors associated with all exposed adjacent playing edges of different cubes match one another. The puzzle has multiple solutions and the pieces can be arranged into a wide variety of different shapes, few of which are symmetrical. The educational value of the puzzle lies in facilitating an understanding of mathematical combinations, but the puzzle teaches little about three-dimensional geometric relationships. A number of U.S. patents, in particular U.S. Pat. Nos. 3,637,216 and 3,655,201, describe novel three-dimensional mechanical device puzzles. The mechanical device puzzles detailed in those patents are characterized by multiple pieces which are permanently attached to one another and do not provide the puzzle solver with three dimensional geometric concepts and spatial relationships while solving the puzzle. Although the puzzles provide the solver with the challenge of matching colors or indicia on exposed surfaces of the puzzle pieces, matching the internal surfaces of the pieces is not an object in solving the puzzle. A puzzle called "Instant Insanity" requires matching colors on the faces of four cubes and has only one solution, which is achieved by trial-and-error. No logic is required to solve the puzzle and the final solution is not a true three-dimensional solution. Thus, the puzzle does not provide education in three-dimensional spacial relationships.

Several U.S. patents describe three-dimensional puzzles which are assembled by fitting together multiple, smaller three-dimensional shapes. Typical of these puzzles is the "Tetrahedron Blocks Capable of Assembly Into Cubes and Pyramids", detailed in U.S. Pat. No. 4,258,479, dated Mar. 31, 1981, to Patricia A. Roane. The puzzle of that invention includes three sets of tetrahedron blocks, each set capable of assembly into a cube, with all the cubes being identical in size. The faces of adjacent tetrahedron blocks magnetically attract each other for assembly into the cube structure. Preferably, the tetrahedron blocks are colored in such a manner that faces of the same size and shape are colored alike, and faces of different sizes and shapes have different colors. U.S. Pat. No. 5,338,034, dated Aug. 16, 1994, to Sabine Asch, discloses a "Three-Dimensional Puzzle" including multiple, irregular pyramids which are assembled into a regular tetrahedron. The apexes of the irregular pyramids all meet at one point in the interior of the in the assembled tetrahedron, and the bases of the irregular pyramids form the regular tetrahedron surfaces. Another "Three-Dimensional Puzzle" to Sabine Asch, is described in U.S. Pat. No. 5,344,148, dated Sep. 6, 1994. The puzzle includes multiple puzzle bodies which are fitted together as chain links to form a chain. The chain can be folded to shape a desired polyhedron such as a tetrahedron, cube or octahedron, for example. U.S. Pat. No. 5,407,201, dated Apr. 18, 1995, to Timothy D. Whitehurst, describes an "Educational Puzzle and Method of Construction". The puzzle includes multiple, three-dimensional pieces which feature indicia overlapping their edges. When a three-dimensional geometric structure is correctly assembled from the pieces, completed indicia appear on all surfaces of the assembled geometric puzzle, with the portion of the indicia on each piece of the surface matching the complimentary portion of the indicia on the adjacent piece.

An object of this invention is to provide multi-polyhedral puzzles for learning about inscribed and circumscribed polyhedra, dual polyhedra and truncation of polyhedra, which puzzle is characterized by four tetrahedra and an octahedron, each assembled from a variety of polyhedron blocks.

Another object of this invention is to provide multi-polyhedral puzzles characterized by four tetrahedra and an

octahedron each assembled from a corresponding set of color-matching polyhedron blocks.

Still another object of this invention is to provide multi-polyhedral puzzles including an octahedron and form tetrahedra characterized by various dissections into respective sets of polyhedron blocks, from which each tetrahedron or octahedron is solved or assembled according to one of three levels of difficulty, which typically includes color-matching of abutting block faces.

Yet another object of this invention is to provide multi-polyhedral puzzles characterized by four tetrahedra and an octahedron, each of which can be assembled from a corresponding set of polyhedron blocks in such a way as to form a prescribed color pattern on each face of the corresponding octahedron or tetrahedron for exploring various permutations and combinations.

A still further object of this invention is to provide multi-polyhedral puzzles including an octahedron and four tetrahedra which are assembled from respective sets of polyhedron blocks, each face of each block being one of multiple colors, wherein same-colored faces of adjacent polyhedron blocks in each octahedron or tetrahedron set can be placed in abutting relationship to assemble the corresponding octahedron or tetrahedron in such a manner that a prescribed color pattern is formed on each face of the octahedron or tetrahedron.

SUMMARY OF THE INVENTION

These and other objects of the invention are provided in multi-polyhedral puzzles including an octahedron and four tetrahedra, each of which is assembled from a corresponding set of polyhedron blocks, each face of each of the polyhedron blocks being one of several different colors. In a preferred embodiment each set of polyhedron blocks represents a dissection or division of the corresponding octahedron or tetrahedron which is different from that of the other sets. The octahedron and each tetrahedron are assembled from the corresponding set of polyhedron blocks inside a corresponding octahedron or tetrahedron-shaped transparent case and according to one of three levels of difficulty, the elementary level of difficulty involving assembly of the octahedron or tetrahedron irrespective of matching colors of abutting faces on adjacent polyhedron blocks. The intermediate level of difficulty involves assembly of the octahedron or tetrahedron to form a prescribed color pattern on the respective faces of the octahedron or tetrahedron, without regard to matching colors of abutting faces on adjacent polyhedron blocks. According to the advanced level of difficulty, same-colored faces of adjacent polyhedron blocks are placed in abutting relationship as the octahedron or tetrahedron is assembled inside the corresponding transparent case and a prescribed color pattern is formed on the respective faces of the octahedron or tetrahedron. The assembled tetrahedra can be arranged on respective faces of the assembled octahedron to form respective vertices of a large tetrahedron or tripyramid in which the octahedron is inscribed, for storage or packaging purposes, for example.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood by reference to the accompanying drawings, wherein:

FIG. **1** is a front view of preferred embodiments of the assembled octahedron and each assembled tetrahedron of the multi-polyhedral puzzles of this invention, with the tetrahedra arranged on respective faces of the octahedron to form a large tetrahedron;

FIG. **2** is an exploded view of the multi-polyhedral puzzles illustrated in FIG. **1**, with each tetrahedron component separated from the central octahedron component;

FIG. **3** is a front view of a transparent case in which the multiple polyhedron blocks of each tetrahedron are fitted in assembling each tetrahedron in preferred embodiments of the multipolyhedral puzzles;

FIG. **4** is an exploded view of a dual tetrahedron of the multi-polyhedral puzzles;

FIG. **4**A is a bottom view of an unfolded, first irregular, large tetrahedron polyhedron block of the dual tetra illustrated in FIG. **4**;

FIG. **4**B is a bottom view of an unfolded, top tripyramid polyhedron block of the dual tetra;

FIG. **4**C is a bottom view of an unfolded, regular tetrahedron polyhedron block of the dual tetra;

FIG. **5** is an exploded view of an icosa tetrahedron component of the multi-polyhedral puzzles;

FIG. **5**A is a central, icosahedral polyhedron block of the icosa tetrahedron illustrated in FIG. **5**;

FIG. **5**B is a bottom view of an unfolded, first small tetrahedron polyhedron block of the icosa tetrahedron;

FIG. **5**C is a bottom view of an unfolded, first icosa pyramid polyhedron block of the icosa tetrahedron;

FIG. **5**D is a bottom view of an unfolded, first large tetrahedron polyhedron block of the icosa tetrahedron;

FIG. **5**E is a bottom view of an unfolded, icosahedron polyhedron block of the icosa tetrahedron;

FIG. **6** is an exploded view of a cubocta tetrahedron component of the multipolyhedral puzzles;

FIG. **6**A is a perspective view of the central, cuboctahedral polyhedron block of the cubocta tetrahedron illustrated in FIG. **6**;

FIG. **6**B is a bottom view of an unfolded, cuboctahedron polyhedron block of the cubocta tetra illustrated in FIG. **6**;

FIG. **6**C is a bottom view of an unfolded, first square pyramid polyhdron block of the cubocta tetra;

FIG. **6**D is a bottom view of an unfolded, first pentahedron polyhedron block of the cubocta tetra;

FIG. **7** is an exploded view of a truncated tetrahedron component of the multi-polyhedral puzzles;

FIG. **7**A is a bottom view of an unfolded, first T-tetrahedron polyhedron block of the T-tetra illustrated in FIG. **7**;

FIG. **7**B is a bottom view of an unfolded, first T-tripyramid polyhedron block of the T-tetra;

FIG. **7**C is a bottom view of an unfolded, first T-pentahedron polyhedron blocks of the T-tetra;

FIG. **8** is an exploded view of the octahedron of the multi-polyhedral puzzles;

FIG. **8**A is a bottom view of the unfolded, top tetrapyramid polyhedron block of the octahedron illustrated in FIG. **8**;

FIG. **8**B is a bottom view of the unfolded, first irregular tetrahedron polyhedron block of the octahedron illustrated in FIG. **8**;

FIG. **8**C is a bottom view of the unfolded, central cube polyhedron block of the octahedron illustrated in FIG. **8**; and

FIG. **9** is a perspective view of a t ransparent case in which the multiple polyhedron blocks of the octahedron are fitted, in assembling the octahedron in a preferred embodiment of the multi-polyhedral puzzles.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to FIGS. **1** and **2** of the drawings, in a preferred embodiment the multi-polyhedral puzzles, hereinafter referred to as the puzzles, of this invention are collectively illustrated by reference numeral **1**. As illustrated in FIGS. **1** and **2**, the puzzles **1** include an octahedron **3**, a regular dual tetrahedron **30**, hereinafter referred to as duel tetra, a regular icosa tetrahedron **43**, hereinafter icosa tetra, a regular cubocta tetrahedron **63**, hereinafter cubocta tetra, and a regular truncated tetrahedron **80**, hereinafter T-tetra, each assembled from a corresponding set of multiple polyhedron blocks according to one of three levels of difficulty, as hereinafter described. As illustrated in FIG. **2**, the assembled octahedron **3** includes a left face **4**, a right face **5**, an icosa face **6** and a dual face **7** in the square pyramid facing the viewer, along with a T-face **8**, a cubocta face **9**, a bottom face **10** and a rear face **11**, in the square pyramid facing away from the viewer, as indicated by the phantom lead lines. A selected triangular face of each assembled dual tetra **30**, icosa tetra **43**, cubocta tetra **63** and T-tetra **80** is typically fitted against the congruent triangular dual face **7**, icosa face **6**, cubocta face **9** and T-face **8**, respectively, of the octahedron **3**, as illustrated in FIG. **2**, to form respective vertices of a large tetrahedron **2**, as illustrated in FIG. **1**, in order to facilitate collective packaging or efficient storage of the puzzles **1**, for example. When the dual tetra **30**, icosa tetra **43**, cubocta tetra **63** and truncated tetra **80** are so arranged on the octahedron **3** to form the large tetrahedron **2**, the left face **4**, right face **5**, bottom face **10** (in phantom) and rear face **11** (also in phantom) of the octahedron **3** remain exposed on the respective faces of the large tetrahedron **2**, such that the octahedron **3** is inscribed in the large tetrahedron **2**, as illustrated in FIG. **1**.

Referring next to FIGS. **8** and **8**C of the drawings, the octahedron **3** is assembled from multiple polyhedron blocks, each typically constructed from paper, cardboard, wood or molded plastic and having various configurations, and each face of each polyhedron block is typically one of three colors. In a preferred embodiment the octahedron **3** is assembled inside a transparent, typically plastic octahedron case **108**, as illustrated in FIG. **9**. The octahedron case **108** includes a first wall **109**, second wall **110**, third wall **111**, fourth wall **113**, fifth wall **114**, sixth wall **115** and seventh wall **116**, defining a case interior **117**. A case door **112** is hinged to the first wall **109** for reversibly closing the case interior **117**. The first wall **109**, second wall **110**, third wall **111**, fourth wall **113**, fifth wall **114**, sixth wall **115**, seventh wall **116** and closed case door **112** define lst-**8**th faces, respectively, of the octahedron **3**. The octahedron **3** includes a first irregular tetrahedron **19**, illustrated in the unfolded configuration in FIG. **8**B, and including a first face **19***a*, a second face **19***b*, a third face **19***c* and a fourth face **19***d*. The first irregular tetrahedron **19** is constructed from the unfolded configuration by folding along the fold lines **121***c* and **121***d* and matching outside edges **121***a* of the third and fourth faces **19***c* and **19***d* with the respective outside edges **121***a* of the second face **19***b* to form the first irregular tetrahedron **19** illustrated in FIG. **8**. The proportion of the length of each edge of the octahedron case **108** (FIG. **9**) to the length of each of the outside edges **121***a*, inside edges **121***b*, fold lines **121***c* and fold line **121***d* of the first irregular tetrahedron **19** is 1:0.5774, 1:0.4715, 1:0.5774 and 1:1, respectively. The octahedron **3** includes second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth and eleventh irregular tetrahedra, designated by reference numerals **20**–**29**, respectively, and a twelfth irregular tetrahedron **42**, each of which has the same configuration and dimensions as the first irregular tetrahedron **19** described above with respect to FIG. **8**B.

The octahedron **3** further includes a top tetrapyramid **13** illustrate configuration in FIG. **8**A, and including a first face **13***a*, a second face **13***b*, a third face **13***c*, a fourth face **13***d* and a fifth face **13***e*. The top tetrapyramid **13** is constructed from the unfolded configuration illustrated in FIG. **8**A, by folding along the fold lines **120***a* and joining adjacent faces along the respective face edges **120***b* to form the top tetrapyramid **13** illusrated in FIG. **8**. The proportion of the length of each edge of the octahedron case **108** to the length of each fold line **120***a* is 1:0.4715, whereas the proportion of the length of each edge of the tetrahedron case **101** to the length of each of the face edges **120***b* is 1:0.5774. The octahedron **3** includes a bottom tetrapyramid **14**, a left rear tetrapyramid **15**, a right rear tetrapyramid **16**, a left front tetrapyramid **17**, and a right front tetrapyramid **18**, each of which has the same configuration and dimensions as the top tetrapyramid **13** described above with respect to FIG. **8**A.

The octahedron **3** also includes a central cube **12** illustrated in unfolded configuration in FIG. **8**C and having a first face **12***a*, a second face **12***b*, a third face **12***c*, a fourth face **12***d*, a fifth face **12***e* and a sixth face **12***f*. The central cube **12** is constructed from the unfolded configuration by folding along the fold lines **122***a* and joining the faces along the respective cube edges **122**. The proportion of the length of each edge of the octahedron case **108** to the length of each of the cube edges **122** and fold lines **122***a* is 1:0.4715.

Referring again to FIGS. **1** and **2** and to FIGS. **8** and **9** of the drawings, at an advanced level of difficulty in assembling the octahedron **3** inside the octahedron case **108** and according to one of several possible methods, the first irregular tetrahedron **19** is first fitted in the case interior **117** of the open octahedron case **108**, with the red first face **19***a* of the first irregular tetrahedron **19** abutting against the seventh wall **116** and the green second face **19***b* against the fourth wall **113** of the octahedron case **108**. The second irregular tetrahedron **20** is next fitted in the case interior **117** in bordering relationship to the first irregular tetrahedron **19**, with the green first face **20***a* of the second irregular tetrahedron **20** abutting against the seventh wall **116** and the light green second face **20***b* against the sixth wall **115** of the octahedron case **108**. The third irregular tetrahedron **21** is placed in the case interior **117** in bordering relationship to the second irregular tetrahedron **20**, with the red first face **21***a* of the third irregular tetrahedron **21** abutting against the fifth wall **114** and the green second face **21***b* against the sixth wall **115** of the octahedron case **108**. The fourth irregular tetrahedron **22** is next fitted between and in bordering relationship to the first irregular tetrahedron **19** and third irregular tetrahedron **21**, with the green first face **22***a* of the fourth irregular tetrahedron **22** resting against the fifth wall **114** and the light green second face **22***b* against the fourth wall **113** of the octahedron case **108**. The inverted, bottom tetrapyramid **14** is cradled between the first irregular tetrahedron **19**, second irregular tetrahedron **20**, third irregular tetrahedron **21** and fourth irregular tetrahedron **22**. The light green first face **14***a* of the bottom tetrapyramid **14** rests against the light green third face **19***c* of the first irregular tetrahedron **19**. Furthermore, the red second face **14***b* rests against the red third face **20***c* of the second irregular tetrahedron **20**, the light green third face **14***c*, against the light green third face **21***c* of the third irregular tetrahedron **21** and the red fourth face **14***d* against the red third face **22***c* of the fourth irregular tetrahedron **22**. The fifth irregular tetrahedron **23** is then fitted in the case interior **117** of the

octahedron case **108** in bordering relationship to said third irregular tetrahedron and said fourth irregular tetrahedron, with the red first face **23***a* abutting against the second wall **110** and the light green second face **23***b*, against the fifth wall **114**, of the octahedron case **108**. The left rear tetrapyramid **15** is next placed in the case interior **117**, with the red first face **15***a* resting on the red fourth face **22***d* of the fourth irregular tetrahedron **22** and the green second face **15***b* abutting against the green third face **23***c* of the fifth irregular tetrahedron **23**. The right rear tetrapyramid **16** is then placed in the case interior **117**, with the light green first face **16***a* resting on the light green fourth face **21***d* of the third irregular tetrahedron **21** and the green second face **16***b* abutting against the green fourth face **23***d* of the fifth irregular tetrahedron **23**. The sixth irregular tetrahedron **24** is next placed in the case interior **117**, in bordering relationship with said first irregular tetrahedron **19** and said fourth irregular tetrahedron **22**, with the light green first face **24***a* abutting against the first wall **109** and the red second face **24***b* against the fourth wall **113**, of the octahedron case **108**. The green third face **24***c* abuts against the green third face **15***c* of the left rear tetrapyramid **15**. The seventh irregular tetrahedron **25** is then fitted in the case interior **117** in bordering relationship to said second irregular tetrahedron **20** and said third irregular tetrahedron **21**, with the light green first face **25***a* abutting against the third wall **111** and the red second face **25***b* against the sixth wall **115**, of the octahedron case **108**. The green third face **25***c* abuts against the green third face **16***c* of the right rear tetrapyramid **16**. The central cube **12** is next placed in the case interior **117**, with the green first face **12***a* resting on the green fifth face **14***e* of the bottom tetrapyramid **14**. The light green second face **12***b* abuts against the light green fourth face **15***d* of the left rear tetrapyramid **15** and the red third face **12***c* against the red fourth face **16***d* of the right rear tetrapyramid **16**. The left front tetrapyramid **17** is then placed in the case interior **117**, with the light green first face **17***a* resting on the light green fourth face **19***d* of the first irregular tetrahedron **19**, the green second face **17***b* abutting against the green fourth face **24***d* of the sixth irregular tetrahedron **24** and the red third face **17***c* against the red fourth face **12***d* of the octahedron cube **12**. The right front tetrapyramid **18** is next fitted in the case interior **117**, with the red first face **18***a* resting on the red fourth face **20***d* of the second irregular tetrahedron **20**, the green second face **18***b* abutting against the green fourth face **25***d* of the seventh irregular tetrahedron **25** and the light green third face **18***c* against the light green fifth face **12***e* of the octahedron cube **12**. The eighth irregular tetrahedron **26** is fitted between the left front tetrapyramid **17** and right front tetrapyramid **18** and in bordering relationship to the first irregular tetrahedron **19** and the second irregular tetrahedron **20**, with the red first face **26***a* facing the case door **112** and the light green second face **26***b* resting against the seventh wall **116** of the octahedron case **108**. The green third face **26***c* abuts against the green fourth face **17***d* of the left front tetrapyramid **17** and the green fourth face **26***d* against the green fourth face **18***d* of the right front tetrapyramid **18**. The ninth irregular tetrahedron **27** is next placed in the case interior **117** in bordering relationship to said fifth irregular tetrahedron **23** and said sixth irregular tetrahedron **24**, with the red first face **27***a* resting on the red fifth face **15***e* of the left rear tetrapyramid **15** and the green second face **27***b* abutting against the first wall **109** and the light green third face **27***c* against the second wall **110** of the octahedron case **108**. The tenth irregular tetrahedron **28** is next placed in the case interior **117** in bordering relationship to the fifth irregular tetrahedron **23**, the seventh irregular tetrahedron **25** and the ninth irregular tetrahedron **27**, with the light green first face **28***a* resting on the light green fifth face **16***e* of the right rear tetrapyramid **16**. The red second face **28***b* abuts against the third wall **111** and the green third face **28***c* against the second wall **110** of the octahedron case **108**. The top tetrapyramid **13** is then fitted inside the case interior **117**, with the green first face **13***a* resting on the green sixth face **12***f* of the central octahedron cube **12**. The light green second face **13***b* abuts against the light green fourth face **28***d* of the tenth irregular tetrahedron **28** and the red third face **13***c*, against the red fourth face **27***d* of the ninth irregular tetrahedron **27**. The eleventh irregular tetrahedron **29** is next fitted in the case interior **117** in bordering relationship to the seventh irregular tetrahedron **25**, the eighth irregular tetrahedron **26** and the tenth irregular tetrahedron **28** with the red first face **29***a* resting against the red fourth face **13***d* of the top tetrapyramid **13** and the red second face **29***b* against the red fifth face **18***e* of the right front tetrapyramid **18**. The green third face **29***c* abuts against the third wall **111** and the light green fourth face **29***d* faces the case door **112** of the octahedron case **108**. To complete assembly of the octahedron **3** in the tetrahedron case **101**, the twelfth irregular tetrahedron **42** is fitted in the remaining space in case interior of **117** in bordering relationship to the sixth irregular tetrahedron **24**, the eighth irregular tetrahedron **26**, the ninth irregular tetrahedron **27** and the eleventh irregular tetrahedron **29**, with the light green first face **42***a* resting against the light green fifth face **13***e* of the top tetrapyramid **13** and the light green second face **42***b* resting on the light green fifth face **17***e* of the left front tetrapyramid **17**. The red third face **42***c* abuts against the first wall **109** and the green fourth face **42***d* faces the case door **112** of the octahedron case **108**. Finally, the case door **112** of the polyhedron case **108** is closed against the red first face **26***a* of the eighth irregular tetrahedron **26**, the light green fourth face **29***d* of the eleventh irregular tetrahedron **29** and the green fourth face **42***d* of the twelfth irregular tetrahedron **42**. When the polyhedron blocks are so arranged in the assembled octahedron **3** in the octahedron case **108**, each triangular face of the octahedron **3** is bounded by a green face of one irregular tetrahedron, a red face of another irregular tetrahedron and a light green face of still another irregular tetrahedron. For example, referring again to FIG. **2** of the drawings, when the top or dual face **7** of the large octahedron **3** corresponds to the case door **112** of the octahedron case **108**, the left face **4** of the octahedron **3**, corresponding to the seventh wall **116** of the octahedron case **108**, is bounded by the light green second face **26***b* of the eighth irregular tetrahedron **26**, the green first face **20***a* of the second irregular tetrahedron **20** and the red first face **19***a* of the first irregular tetrahedron **19**. Likewise, the right face **5** of the octahedron **3**, corresponding to the third wall **111** of the octahedron case **108**, is bounded by the light green first face **25***a* of the seventh irregular tetrahedron **25**, the red second face **28***b* of the tenth irregular tetrahedron **28** and the green third face **29***c* of the eleventh irregular tetrahedron **29**. It will be appreciated by those skilled in the art that the foregoing description involves an advanced level of difficulty in assembling the octahedron **3** in the octahedron case **108**, by matching colors of abutting, congruent faces of adjacent polyhedron blocks in the puzzle. At an intermediate level of difficulty in assembling the octahedron **3**, the polyhedron blocks are assembled in the octahedron case **108** to form the three-color pattern on each face of the octahedron **3**, but without regard to matching colors of abutting congruent faces of adjacent polyhedron blocks. At an elementary level of difficulty in assembling the octahedron **3**, the polyhedron blocks are assembled in the

octahedron case **108** without regard to matching colors of abutting, congruent faces of adjacent polyhedron blocks or formation of the three-color pattern on each face of the octahedron **3**. It is understood that each color on the respective faces of each polyhedron block can be substituted by one of three different colors other than green, light green and red, as described above, with the same color on different faces substituted by the same color. In that case, matching colors of abutting faces on adjacent polyhedron blocks according to the advanced level of difficulty described above would provide the same degree of difficulty in assembling the octahedron **3**, as well as the prescribed color pattern formation on each face of the octahedron **3**.

Referring now to FIGS. **3** and particularly to FIGS. **4**–**4**C of the drawings, in a preferred embodiment the dual tetra **30** is assembled inside a transparent, typically plastic, pyramidal tetrahedron case **101**, illustrated in phantom. The tetrahedron case **101** has four vertices **101***a* and includes a left wall **102**, a right wall **103** and a bottom wall **104** defining a case interior **105**, with a case door **106** hinged to the bottom wall **104** for reversibly closing the case interior **105**, as illustrated in FIG. **3**. The dual tetra **30** includes a first irregular, large tetrahedron **36** illustrated in unfolded configuration in FIG. **4**A and including a first face **36***a*, second face **36***b*, third face **36***c* and fourth face **36***d*. The first irregular, large tetrahedron **36** is constructed from the unfolded configuration illustrated in FIG. **4**A, by folding along the fold lines **124***c* and **124***d* and matching outside edges **124***a* of the third and fourth faces **36***c* and **36***d*, respectively, with the respective outside edges **124***a* of the first face **36***a*. The proportion of the length of each edge of the tetrahedron case **101** (FIG. **3**) to the length of each of the outside edges **124***a*, inside edges **124***b*, fold lines **124***c* and fold line **124***d*, is 1:0.5774, 1:0.3333, 1:0.5774 and 1:1, respectively. The dual tetra **30** includes second, third, fourth, fifth and sixth irregular, large tetrahedron, designated by reference numerals **37**–**41**, respectively, in FIG. **4**, each of which has the same configuration and dimensions as the first irregular, large tetrahedron **36** described above with respect to FIG. **4**A. The dual tetra **30** further includes a top tripyramid **32**, illustrated in the unfolded configuration in FIG. **4**B and including a first face **32***a*, a second face **32***b*, a third face **32***c* and a fourth face **32***d*. The top tripyramid **32** is constructed from the unfolded configuration illustrated in FIG. **4**B, by folding along the fold lines **125***c* and base fold line **125***d*, and joining the respective base edges **125***a* and the face edges **125***b*. The proportion of the length of each edge of the tetrahedron case **101** to the length of each base edge **125***a*, face edge **125***b*, fold lines **125***c* and base fold line **125***d*, is 1:0.3333, 1:0.5774, 1:0.5774 and 1:0.3333, respectively. The dual tetra **30** includes a left tripyramid **33**, a right tripyramid **34** and a rear tripyramid **35**, each of which has the same configuration and dimensions as the top tripyramid **32** described above with respect to FIG. **4**B. The dual tetra **30** further includes a regular tetrahedron, illustrated in the unfolded configuration in FIG. **4**C and having a first face **31***a*, a second face **31***b*, a third face **31***c* and a fourth face **31***d*. The regular tetrahedron **31** is constructed from the unfolded configuration illustrated in FIG. **4**C, by folding along the fold lines **126***b* and joining the adjacent face edges **126***a*. The proportion of the length of each edge of the tetrahedron case **101** to the length of each face edge **126***a* and each fold line **126***b* is 1:0.3333.

Referring again to FIGS. **1** and **2** and particularly to FIGS. **3** and **4** of the drawings, at an advanced level of difficulty an advanced level of difficulty in assembling the dual tetra **30** in the tetrahedron case **101** according to one of several possible methods, the first irregular, large tetrahedron **36** is initially placed in the case interior **105** of the open tetrahedron case **101**, with the red first face **36***a* abutting against the left wall **102** and the green second face **36***b* resting on the bottom wall **104** of the tetrahedron case **101**. The second irregular, large tetrahedron **37** is next fitted in the case interior **105**, with the purple first face **37***a* abutting against the right wall **103** and the green second face **37***b* resting on the bottom wall **104** of the tetrahedron case **101**. The rear tripyramid **35** is next inserted between the first irregular, large tetrahedron **36** and the second irregular, large tetrahedron **37**, with the purple first face **35***a* resting against the purple third face **36***c* of the first irregular, large tetrahedron **36** and the red second face **35***b*, against the red third face **37***c* of the second irregular, large tetrahedron **37**. The third irregular, large tetrahedron **38** is next fitted in the case interior **105**, with the green first face **38***a* resting on the green third face **35***c* of the rear tripyramid **35**. The red second face **38***b* abuts against the left wall **102** and the purple third face **38***c* against the right wall **103** of the tetrahedron case **101**. The fourth irregular, large tetrahedron **39** is next placed between the first irregular, large tetrahedron **36** and second irregular, large tetrahedron **37**, such that the green first face **39***a* of the fourth irregular, large tetrahedron **39** rests on the bottom wall **104** and the blue second face **39***b* faces the case door **106** of the tetrahedron case **101**. The left tripyramid **33** is then fitted between the first irregular, large tetrahedron **36** and fourth irregular, large tetrahedron **39**, such that the blue first face **33***a* abuts against the blue fourth face **36***d* of the first irregular, large tetrahedron **36**, and the red second face **33***b* against the red third face **39***c* of the fourth irregular, large tetrahedron **39**. The right tripyramid **34** is next fitted between the second irregular, large tetrahedron **37** and fourth irregular, large tetrahedron **39**, such that the blue first face **34***a* rests against the blue fourth face **37***d* of the second irregular, large tetrahedron **37** and the purple second face **34***b* against the purple fourth face **39***d* of the fourth irregular, large tetrahedron **39**. The regular tetrahedron **31** is then placed in the case interior **105**, such that the blue rear or first face **31***a* abuts against the blue fourth face **35***d* of the rear tripyramid **35**, the purple second face **31***b* against the purple third face **33***c* of the left tripyramid **33** and the red third face **31***c* against the red third face **34***c* of the right tripyramid **34**. The top tripyramid **32** is next placed in the case interior **105**, with the green bottom or first face **32***a* resting on the green fourth face **31***d* of the regular tetrahedron **31** and the blue second or rear face **32***b* against the blue fourth face **38***d* of the third irregular, large tetrahedron **38**. The fifth irregular, large tetrahedron **40** is next placed in the case interior **105**, with the purple first face **40***a* abutting against the purple third face **32***c* of the top tripyramid **32** and the green second face **40***b* resting on the green fourth face **33***d* of the left tripyramid **33**. The blue third face **40***c* faces the case door **106** and the red fourth face **40***d* abuts against the left wall **102** of the tetrahedron case **101**. Finally, to complete assembly of the dual small tetrahedron **30**, the sixth irregular, large tetrahedron **41** is fitted in the remaining space in the case interior **105**, with the red first face **41***a* abutting against the red fourth face **32***d* of the top tripyramid **32** and the green second face **41***b* resting on the green fourth face **34***d* of the right tripyramid **34**. The blue third face **41***c* faces the case door **106** and the purple fourth face **41***d* abuts against the right wall **103** of the tetrahedron case **101**. Finally, the case door **106** of the tetrahedron case **101** is closed against the blue second face **39***b* of the fourth irregular, large tetrahedron **39**, the blue third face **40***c* of the fifth irregular, large tetrahedron **40** and the blue third face **41***c* of the sixth irregular, large tetrahedron **41**.

As illustrated in FIGS. **1** and **2** of the drawings, when the polyhedron blocks are assembled into the dual tetra **30** in the tetrahedron case **101** according to the foregoing description, each face of the dual tetra **30** is the same color. For example, as described above, the blue third face **40***c* of the fifth irregular, large tetrahedron **40**, the blue third face **41***c* of the sixth irregular, large tetrahedron **41** and the blue second face **39***b* of the fourth irregular, large tetrahedron **39** combine to form a front face **30***a* of the dual tetra **30** corresponding to the closed case door **106** of the tetrahedron case **101**, which is blue in color. In similar fashion, the purple fourth face **41***d* of the sixth irregular, large tetrahedron **41**, the purple fourth face **38***c* of the third irregular, large tetrahedron **38** and the purple first face **37***a* of the second irregular, large tetrahedron **37**, combine to form a right face **30***b* of the dual tetra **30**, which is purple in color and corresponds to the right wall **103** of the tetrahedron case **101**. As with the description of assembling the octahedron **3** set forth above, the foregoing description involves an advanced or difficult level of assembling the dual tetra **30** from the constituent polyhedron blocks. At an intermediate level of difficulty in assembling the dual tetra **30**, the polyhedron blocks are assembled in the tetrahedron case **101** to form the uniform color pattern on each face of the dual tetra **30**, but without regard to matching colors of abutting faces of adjacent polyhedron blocks. At an elementary level of assembling the dual tetra **30**, the polyhedron blocks are fitted in the tetrahedron case **101** in the same orientations described above, although without regard to matching colors of abutting faces on adjacent polyhedron blocks or uniform color formation on each face of the dual tetra **30**. It is understood that each color on the respective faces of each polyhedron block can be substituted by one of four different colors other than red, blue, purple and green, as described above, with the same color on different faces substituted by the same color. Accordingly, matching colors of abutting faces on adjacent polyhedron blocks according to the advanced level of difficulty described above would provide the same degree of difficulty in assembling the dual tetra **30**, as well as a uniform color pattern formation on each face of the dual tetra **30**.

Referring next to FIGS. **5**–**5**E of the drawings, the icosa tetra **43** is assembled from multiple polyhedron blocks in a second tetrahedron case **101** (FIG. **2**) according to an advanced, intermediate or elementary level of difficulty, as hereinafter described. The icosa tetra **43** includes a first small tetrahedron **49**, illustrated in the unfolded configuration in FIG. **5**B and including a first face **49***a*, a second face **49***b*, a third face **49***c* and a fourth face **49***d*. The first small tetrahedron **49** is constructed from the unfolded configuration illustrated in FIG. **5**B, by folding along the front fold line **128***d* and longitudinal fold line **128***f* and joining the front edges **128***a*, and folding along the rear fold line **128***e* and joining the rear edges **128***c* and inside edges **128***b*. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the front edges **128***a*, the inside edges **128***b*, the rear edges **128***c*, the front fold line **128***d*, the rear fold line **128***e* and the longitudinal fold line **128***f*, is 1:0.25, 1:0.25, 1:0.45, 1:0.25, 1:0.45 and 1:1, respectively. The icosa tetra **43** includes a first small tetrahedron **49**, a second small tetrahedron **50**, a third small tetrahedron **51**, a fourth small tetrahedron **52**, a fifth small tetrahedron **53** and a sixth small tetrahedron **54**, each of which has the same configuration and dimensions as the first small tetrahedron **49** described above with respect to FIG. **5**B. The icosa tetra **43** includes a first icosa pyramid **45**, illustrated in the unfolded configuration in FIG. **5**C and having a first face **45***a*, a second face **45***b*, a third face **45***c* and a fourth face **45***d*. The first icosa pyramid **45** is constructed from the unfolded configuration by folding along the fold lines **129***c* and base fold line **129***d*, and joining the base edges **129***a* and face edges **129***b*. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the base edges **129***a*, the face edges **129***b*, the fold lines **129***c* and base fold line **129***d*, is 1:0.25, 1:0.45, 1:0.45 and 1:0.25, respectively. The icosa tetra **43** includes a second icosa pyramid **46**, a third icosa pyramid **47** and a fourth icosa pyramid **48**, each of which has the same configuration and dimensions as the first icosa pyramid **45** described above with respect to FIG. **5***c*.

The icosa tetra **43** further includes a first large tetrahedron **55**, illustrated in the unfolded configuration in FIG. **5**D and having a first face **55***a*, a second face **55***b*, a third face **55***c* and a fourth face **55***d*. The first large tetrahedron **55** is constructed from the unfolded configuration by folding along the front fold line **130***d* and longitudinal fold line **130***f* and joining the front edges **130***a* and folding along the rear fold line **130***e* and joining the rear edges **130***c* and inside edges **130***b*. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the front edges **130***a*, inside edges **130***b*, rear edges **130***c*, front fold line **130***d*, rear fold line **130***e* and longitudinal fold line **130***f*, is 1:0.45, 1:0.25, 1:0.7, 1:0.45, 1:0.61 and 1:1, respectively. The icosa tetra **43** includes a second large tetrahedron **56**, a third large tetrahedron **57**, a fourth large tetrahedron **58**, a fifth large tetrahedron **59** and a sixth large tetrahedron **60**, each of which has the same configuration and dimensions as the first large tetrahedron **55** described above with respect to FIG. **5**D. The icosa tetra **43** includes an icosahedron **44**, illustrated in the unfolded configuration in FIG. **5**E and having twenty faces, designated by reference numerals **44***a*–**44***t*, respectively. The icosahedron **44** is constructed from the unfolded configuration by folding along the fold lines **132***b* and joining the respective face edges **132***a*, according to the knowledge of those skilled in the art. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the face edges **132***a* and fold lines **132***b*, is 1:0.25.

Referring again to FIGS. **1**–**3** and particularly to FIG. **5** of the drawings, in assembling the icosa tetra **43** from multiple polyhedron blocks in a second tetrahedron case **101**, at an advanced level of difficulty and according to one of several possible methods, the first large tetrahedron **55** is initially placed in the case interior **105** of the open tetrahedron case **101**, with the blue first face **55***a* abutting against the left wall **102** and the light green second face **55***b* resting on the bottom wall **104** of the tetrahedron case **101**. The second large tetrahedron **56** is then placed in the case interior **105**, with the orange first face **56***a* abutting against the right wall **103** and the light green second face **56***b* resting on the bottom wall **104** of the tetrahedron case **101**. The first icosa pyramid **45** is next placed in the case interior **105**, with the blue first face **45***a* resting against the blue third face **56***c* of the second large tetrahedron **56**. The first small tetrahedron **49** is next placed in the case interior **105**, with the orange first face **49***a* resting against the orange second face **45***b* of the first icosa pyramid **45**, the yellow second face **49***b* resting on the yellow third face **55***c* of the first large tetrahedron **55** and the light green third face **49***c* abutting against the left wall **102** of the tetrahedron case **101**. The third large tetrahedron **57** is then fitted in the case interior **105**, with the yellow first face **57***a* resting on the yellow third face **45***c* of the first icosa pyramid **45**. The blue second face **57***b* of the third large tetrahedron **57** abuts against the left wall **102** and the orange third face **57***c* against the right wall

103 of the tetrahedron case **101**. The second small tetrahedron **50** is next fitted in the case interior **105**, with the blue first face **50***a* resting on the blue fourth face **56***d* of the second large tetrahedron **56** and the yellow second face **50***b* of the second small tetrahedron **50** abutting against the right wall **103** of the tetrahedron case **101**. The icosahedron **44**, illustrated in FIG. **5***a*, is then fitted in the case interior **105**, with the orange first face **44***a* abutting against the orange fourth face **49***d* of the first small tetrahedron **49**, the light green second face **44***b* against the light green fourth face **45***d* of the first icosa pyramid **45**, the blue third face **44***c* against the blue fourth face **56***d* of the second large tetrahedron **56**, the orange fourth face **44***d* against the orange third face **50***c* of the second small tetrahedron **50** and the yellow sixteenth face **44***p* resting against the yellow third face **55***c* of the first large tetrahedron **55**. When the icosahedron **44** is so fitted in the tetrahedron case **101**, the icosahedron **44** is inscribed in the icosa tetra **43** with the red seventh face **44***g* facing the case door **106**, the red tenth face **44***j* abutting against the left wall **102**, the red thirteenth face **44***m*, against the right wall **103** and the red seventeenth face **44***q* resting on the bottom wall **104**, of the tetrahedron case **101**. The second icosa pyramid **46** is next fitted in the case interior **105**, with the blue first face **46***a* abutting against the blue twentieth face **44***t* of the icosahedron **44** and the yellow second face **46***b* against the yellow fourth face **55***d* of the first large tetrahedron **55**. The fourth large tetrahedron **58** is next placed in the case interior **105**, with the light green first face **58***a* abutting against the light green eighteenth face **44***r* of the icosahedron **44**. The light green second face **58***b* rests on the bottom wall **104** and the yellow third face **58***c* faces the case door **106** of the tetrahedron case **101**. The third icosa pyramid **47** is then fitted in the case interior **105**, with the yellow first face **47***a* abutting against the yellow fifth face **44***e* of the icosahedron **44**, the orange second face **47***b* against the orange fourth face **50***d* of the second small tetrahedron **50** and the light green third face **47***c* against the light green fourth face **58***d* of the fourth large tetrahedron **58**. The third small tetrahedron **51** is next inserted between the second icosa pyramid **46** and fourth large tetrahedron **58**, with the orange first face **51***a* abutting against the orange third face **46***c* of the second icosa pyramid **46**, the orange second face **51***b* abutting against the orange nineteenth face **44***s* of the icosahedron **44** and the light green third face **51***c* resting on the light green first face **58***a* of the fourth large tetrahedron **58**. The blue fourth face **51***d* faces the case door **106** of the tetrahedron case **101**. The fifth large tetrahedron **59** is next placed in the case interior **105**, with the light green first face **59***a* resting on the light green fourteenth face **44***n* of the icosahedron **44**. The orange second face **59***b* abuts against the right wall **103** and the yellow third face **59***c* faces the case door **106** of the tetrahedron case **101**. The fourth small tetrahedron **52** is next placed in the case interior **105**, with the blue first face **52***a* resting on the blue sixth face **44***f* of the icosahedron **44**, the blue second face **52***b* resting on the blue fourth face **47***d* of the third icosa pyramid **47**, the light green third face **52***c* abutting against the light green first face **59***a* of the fifth large tetrahedron **59** and the blue fourth face **52***d* facing the closed case door **106** of the tetrahedron case **101**. The fifth small tetrahedron **53** is next placed in the case interior **105**, with the blue first face **53***a* resting on the blue eleventh face **44***k* of the icosahedron **44** and the yellow second face **53***b* abutting against the yellow fourth face **57***d* of the third large tetrahedron **57**. The light green third face **53***c* abuts against the left wall **102** of the tetrahedron case **101**. The fourth icosa pyramid **48** is then placed in the case interior **105**, with the orange first face **48***a* resting on the orange fifteenth face **44***o* of the icosahedron **44**, the light green second face **48***b* abutting against the light green fourth face **59***d* of the fifth large tetrahedron **59** and the blue third face **48***c* abutting against the blue fourth face **53***d* of the fifth small tetrahedron **53**. The sixth large tetrahedron **60** is next fitted in the case interior **105**, with the light green first face **60***a* resting against the light green fourth face **46***d* of the second icosa pyramid **46** and the light green second face **60***b* resting against the light green ninth face **44***i* of the icosahedron **44**. The blue third face **60***c* abuts against the left wall **102** and the yellow fourth face **60***d*, against the closed case door **106**, of the tetrahedron case **101**. To complete assembly of the icosa tetra **43**, the sixth small tetrahedron **54** is fitted in the remaining space in the case interior **105**, with the yellow first face **54***a* abutting against the yellow fourth face **48***d* of the fourth icosapyramid **48**, the yellow second face **54***b* resting on the yellow eighth face **44***h* of the icosahedron **44**, the light green third face **54***c* abutting against the light green second face **60***b* of the sixth large tetrahedron **60** and the blue fourth face **54***d* facing the case door **106** of the tetrahedron case **101**. Finally, the case door **106** of the tetrahedron case **101** is closed.

As illustrated in FIGS. **1** and **2** of the drawings, when the polyhedron blocks are assembled into the icosa tetra **43** according to the foregoing description, each face of the icosa tetra **43** is bordered by the same color. For example, the front face **43***a*, corresponding to the case door **106** of the tetrahedron case **101**, is bordered by the yellow third face **58***c* of the fourth large tetrahedron **58**, the yellow third face **59***c* of the fifth large tetrahedron **59** and the yellow fourth face **60***d* of the sixth large tetrahedron **60**. Likewise, the right face **43***b*, corresponding to the right wall **103** of the tetrahedron case **101**, is bordered by the orange first face **56***a* of the second large tetrahedron **56**, the orange third face **57***c* of the third large tetrahedron **57** and the orange second face **59***b* of the fifth large tetrahedron **59**. Furthermore, the faces of all small tetrahedra on each face of the icosa tetra **43** have the same color. For example, on the front face **43***a* of the icosa tetra **43**, the blue fourth face **51***d* of the third small tetrahedron **51**, the blue fourth face **52***d* of the fourth small tetrahedron **52** and the blue fourth face **54***d* of the sixth small tetrahedron **54** appear. At an intermediate level of difficulty in assembling the icosa tetra **43**, the polyhedron blocks are assembled in the tetrahedron case **101** to form the above-described color pattern on each face of the icosa tetra **43**, but without regard to matching colors of abutting faces of adjacent polyhedron blocks. At an elementary level of difficulty of assembling the icosa tetra **43**, the polyhedron blocks are placed in the tetrahedron case **101** in the same orientations as described above, except without regard to matching colors of abutting surfaces on adjacent polyhedron blocks or formation of the prescribed color pattern, as heretofore described with respect to assembly of the octahedron **3** and dual tetra **30**, respectively. It is understood that each color on the respective faces of each polyhedron block can be substituted by a color other than those described above, with the same color on different faces substituted by the same color. Accordingly, matching colors of abutting faces on adjacent polyhedron blocks according to the advanced level of difficulty described above would provide the same degree of difficulty in assembling the icosa tetra **43**, as well as the prescribed color pattern formation on each face of the icosa tetra **43**.

Referring next to FIGS. **6**–**6**D of the drawings, the cubocta tetra **63** is assembled from multiple polyhedron blocks in a second tetrahedron case **101** (FIG. **2**) according to an advanced, intermediate or elementary level of difficulty, as

hereinafter described. The cubocta tetra **63** includes a cuboctahedron **64**, illustrated in unfolded configuration in FIG. **6**B and including fourteen faces designated by reference numerals **64***a*–**64***n*, respectively. The cuboctahedron **64** is constructed from the unfolded configuration by folding along the fold lines **134***b* and joining the face edges **134***a* of adjacent faces to form the cuboctahedron illustrated in FIG. **6**A, according to the knowledge of those skilled in the art. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the face edges **134***a* and fold lines **134***b*, is 1:0.25.

The cubocta tetra **63** further includes a first square pyramid **65**, illustrated in unfolded configuration in FIG. **6**C and having a first face **65***a*, a second face **65***b*, a third face **65***c*, a fourth face **65***d* and a fifth face **65***e*. The first square pyramid **65** is constructed from the unfolded configuration by folding along the fold lines **135***b* and joining the face edges **135***a* of adjacent faces to form the first square pyramid **65** illustrated in FIG. **6**. The proportion of the length of each edge of the tetrahedron case **101** to the length of each of the face edges **135***a* and fold lines **135***b*, is 1:0.25. The cubocta tetra **63** also includes a second square pyramid **66**, a third square pyramid **67**, a fourth square pyramid **68**, a fifth square pyramid **69** and a sixth square pyramid **70**, each of which has the same configuration and dimensions as the first square pyramid **65** described above with respect to FIG. **6**C.

The cubocta tetra **63** still further includes a first pentahedron **71**, illustrated in unfolded configuration in FIG. **6**D and having a first face **71***a*, a second face **71***b*, a third face **71***c*, a fourth face **71***d* and a fifth face **71***e*. The first pentahedron **71** is constructed from the unfolded configuration by folding along the fold lines **136***c* and joining the long face edges **136***b* and short face edges **136***a* to form the first pentahedron **71** illustrated in FIG. **6**. The proportion of the length of each face of the tetrahedron case **101** to the length of each of the short face edges **136***a*, the long face edges **136***b* and the fold lines **136***c*, is 1:0.25, 1:0.50, and 1:0.25, respectively. The cubocta tetra **63** also includes a second pentahedron **72**, a third pentahedron **73**, a fourth pentahedron **74**, a fifth pentahedron **75**, a sixth pentahedron **76**, a seventh pentahedron **77** and an eighth pentahedron **78**, each of which has the same configuration and dimensions as the first pentahedron **71** described above with respect to FIG. **6**D.

Referring again to FIGS. **1**–**3** and particularly to FIGS. **6** and **6***a* of the drawings, at an advanced level of difficulty in assembling the cubocta tetra **63** inside a third transparent tetrahedron case **101** according to one of several possible methods, the first pentahedron **71** is initially fitted in the case interior **105** at a vertex **101***a* of the open tetrahedron case **101**. The purple first face **71***a* rests on the bottom wall **104**, the green second face **71***b* abuts against the right wall **103** and the blue third face **71***c* against the left wall **102** of the tetrahedron case **101**. The second pentahedron **72** is next fitted in the case interior **105**, with the purple first face **72***a* resting on the bottom wall **104** and the blue second face **72***b* abutting against the left wall **102** and the green third face **72***c* against the right wall **103** of the tetrahedron case **101**. The light green fourth face **72***d* rests against the light green fourth face **71***d* of the first pentahedron **71**. The first square pyramid **65** is then placed in the case interior **105**, with the green first face **65***a* abutting against the left wall **102** and the green second face **65***b* resting on the bottom wall **104** of the tetrahedron case **101**. The light green third face **65***c* abuts against the light green fifth face **72***e* of the second pentahedron **72**. The second square pyramid **66** is then placed in the case interior **105**, with the blue first face **66***a* abutting against the right wall **103** and the blue second face **66***b* resting on the bottom wall **104** of the tetrahedron case **101**. The light green third face **66***c* abuts against the light green fifth face **71***e* of the first pentahedron **71**. The cuboctahedron **64** (FIG. **6**A) is next placed in the case interior **105**, with the light green first face **64***a* abutting against the left wall **102**, the light green second face **64***b*, against the right wall **103**, the light green third face **64***c* resting on the bottom wall **104** and the light green fourth face **64***d* facing the case door **106** of the tetrahedron case **101**. The light green fifth face **64***e* of the cuboctahedron **64** rests against the light green fifth face **72***e* of the second pentahedron **72**, the blue sixth face **64***f* against the blue fourth face **65***d* of the first square pyramid **65** and the purple seventh face **64***g* against the purple fourth face **66***d* of the second square pyramid **66**. The third square pyramid **67** is next placed in the case interior **105**, with the purple first face **67***a* abutting against the left wall **102** and the purple second face **67***b* against the right wall **103** of the tetrahedron case **101**. The green third face **67***c* rests against the green eighth face **64***h* of the cuboctahedron **64** and the light green fourth face **67***d* rests on the light green fifth face **72***e* of the second pentahedron **72**. The third pentahedron **73** is next placed in the case interior **105** at another vertex **101***a* thereof with the blue first face **73***a* resting on the bottom wall **104**, the purple second face **73***b* abutting against the left wall **102** and the third green face **73***c* facing the case door **106** of the tetrahedron case **101**. The fourth pentahedron **74** is next placed in the case interior **105**, with the blue first face **74***a* resting on the bottom wall **104**, the green second face **74***b* facing the case door **106** and the purple third face **74***c* abutting against the left wall **102** of the tetrahedron case **101**. The blue fourth face **74***d* rests on the blue fourth face **73***d* of the third pentahedron **73** and the light green fifth face **74***e* against the light green ninth face **64***i* of the cuboctahedron **64** and the light green fifth face **65***e* of the first square pyramid **65**. The fourth square pyramid **68** is then placed in the case interior **105**, with the blue first face **68***a* abutting against the left wall **102** and the blue second face **68***b*, facing the case door **106** of the tetrahedron case **101**. The purple third face **68***c* rests against the purple tenth face **64***j* of the cuboctahedron **64** and the light green fourth face **68***d* rests on the light green fifth face **74***e* of the fourth pentahedron **74**. The fifth square pyramid **69** is then placed between the fourth pentahedron **74** and the cuboctahedron **64**, with the purple first face **69***a* resting on the bottom wall **104** and the purple second face **69***b* facing the case door **106** of the tetrahedron case **101**. The light green third face **69***c* rests against the light green fifth face **73***e* of the third pentahedron **73** and the green fourth face **69***d* abuts against the green eleventh face **64***k* of the cuboctahedron **64**. The fifth pentahedron **75** is next placed in the case interior **105** at another vertex **101***a* thereof with the green first face **75***a* resting on the bottom wall **104**, the purple second face **75***b* abutting against the right wall **103** and the blue third face **75***c* facing the case door **106** of the tetrahedron case **101**. The light green fourth face **75***d* abuts against the light green fifth face **69***e* of the fifth square pyramid **69**, the light green twelfth face **641** of the cuboctahedron **64** and the light green fifth face **66***e* of the second square pyramid **66**. The sixth pentahedron **76** is then placed in the case interior **105**, with the green first face **76***a* resting on the bottom wall **104**, the purple second face **76***b* abutting against the right wall **103** and the blue third face **76***c* facing the case door **106** of the tetrahedron case **101**. The purple fourth face **76***d* rests against the purple fifth face **75***e* of the fifth pentahedron **75**. The sixth square pyramid **70** is next fitted in the case interior **105**, with the green first face **70***a* abutting against the right wall **103** and the green second face **70***b* facing the case door

106 of the tetrahedron case 101. The blue third face 70*c* rests against the blue thirteenth face 64*m* of the cuboctahedron 64 and the light green fourth face 70*d*, against the light green fifth face 76*e* of the sixth pentahedron 76. The seventh pentahedron 77 is next placed in the case interior 105, with the blue first face 77*a* abutting against the right wall 103, the green second face 77*b*, against the left wall 102 and the purple third face 77*c* facing the case door 106 of the tetrahedron case 101. The light green fourth face 77*d* rests on the light green fifth face 70*e* of the sixth square pyramid 70, the light green fourteenth face 64*n* of the cuboctahedron 64 and the light green fifth face 67*e* of the third square pyramid 67. To complete assembly of the cubocta small tetrahedron 63 in the tetrahedron case 101, the eighth pentahedron 78 is placed in the remaining space in the case interior 105 at the remaining vertex 101*a* thereof with the blue first face 78*a* abutting against the right wall 103 and the green second face 78*b* abutting against the left wall 102 and the purple third face 78*c* facing the case door 106 of the tetrahedron case 101. The light green fourth face 78*d* rests on the light green fifth face 68*e* of the fourth square pyramid 68 and the green fifth face 78*e* rests against the green fifth face 77*e* of the seventh pentahedron 77. Finally, the case door 106 of the tetrahedron case 101 is closed.

As illustrated in FIGS. 1 and 2 of the drawings, when the polyhedron blocks are assembled into the cubocta tetra 63 according to the foregoing description, each of the three vertices on each face of the cubocta tetra 30 is one of three colors. For example, on the front face 63*a* of the cubocta tetra 63, corresponding to the case door 106 of the tetrahedron case 101, the vertex formed by the third face 73*c* of the third pentahedron 73 and second face 74*b* of the fourth pentahedron 74, is green; the vertex formed by the third face 75*c* of the fifth pentahedron 75 and third face 76*c* of the sixth pentahedron 76, is blue; and the vertex formed by the third face 77*c* of the seventh pentahedron 77 and third face 78*c* of the eighth pentehedron 78, is purple. Furthermore, the three faces of the respective square pyramids on each face of the cubocta tetra 63 are three different colors. On the front face 63*a* of the cubocta tetra 63, for example, the second face 68*b* of the fourth square pyramid 68 is blue, the second face 69*b* of the fifth square pyramid 69 is purple and the second face 70*b* of the sixth square pyramid 70 is green. As in the cases with respect to the octahedron 3, dual tetra 30 and icosa tetra 43, respectively, described above, at an intermediate level of difficulty in assembling the cubocta tetra 63, the polyhedron blocks are assembled in the tetrahedron case 101 to form the color pattern described above on each face of the cubocta tetra 63, but without regard to matching colors of abutting faces of adjacent polyhedron blocks. At an elementary level of difficulty in assembling the cubocta tetra 63 from the constituent polyhedron blocks, the cubocta tetra 63 is assembled in the tetrahedron case 101 without regard to matching colors of abutting faces on adjacent polyhedron blocks or color pattern formation on the respective faces of the cubocta tetra 63. It is understood that each color on the respective faces of each polyhedron block can be substituted by a color other than those described above, with the same color on different faces substituted by the same color. Such color substitution would provide the same degree of difficulty in assembling the cubocta tetra 63, as well as the prescribed color pattern formation on each face of the cubocta tetra 63, when the cubocta tetra 63 is assembled according to the advanced level of difficulty described above.

Referring now to FIGS. 7–7C of the drawings, the T-tetra 80 is assembled from multiple polyhedron blocks in a fourth tetrahedron case 101 (FIG. 2) according to an advanced, intermediate or elementary level of difficulty, as hereinafter described. The T-tetra 80 includes a first T-tetrahedron 97, illustrated in unfolded configuration in FIG. 7A and including a base or first face 97*a*, a second face 97*b*, a third face 97*c* and a fourth face 97*d*. The first T-tetrahedron 97 is constructed from the unfolded configuration by folding along the fold lines 138*c* and base fold line 138*d* and joining the base edges 138*a* and face edges 138*b* to form the first T-tetrahedron 97 illustrated in FIG. 7. The proportion of the length of each edge of the tetrahedron case 101 to the length of each of the base edges 138*a*, face edges 138*b*, fold lines 138*c* and base fold line 138*d*, is 1:0.3333, 1:0.3908, 1:0.3908, and 1:0.3333, respectively. The T-tetra 80 includes a second T-tetrahedron 98, a third T-tetrahedron 99, and a fourth T-tetrahedron 100, each of which has the same configuration and dimensions as the first T-tetrahedron 97 described above with respect to FIG. 7A.

The T-tetra 80 further includes a first T-tripyramid 81, illustrated in the unfolded configuration in FIG. 7B and including a first face 81*a*, a second face 81*b*, a third face 81*c* and a fourth face 81*d*. The first T-tripyramid 81 is constructed from the unfolded configuration by folding along the fold lines 139*b* and joining the face edges 139*a* of adjacent faces to form the first T-tripyramid 81 illustrated in FIG. 7. The proportion of the length of each edge of the tetrahedron case 101 to the length of each of the face edges 139*a* and fold lines 139*b*, is 1:0.3333. The T-tetra 80 includes a second T-tripyramid 82, a third T-tripyramid 83 and a fourth T-tripyramid 84, each of which has the same configuration and dimensions as the first T-tripyramid 81 described above with respect to FIG. 7B. The T-tetra 80 still further includes a first T-pentahedron 85, illustrated in unfolded configuration in FIG. 7*c* and including a first face 85*a*, a second face 85*b*, a third face 85*c*, a fourth face 85*d* and a fifth face 85*e*. The first Tpentahedron 85 is constructed from the unfolded configuration by folding along the fold lines 140*d* and joining the respective side edges 140*b*, the front edges 140*a* and the rear edges 140*c*, to form the first T-pentahedron 85 illustrated in FIG. 7. The proportion of the length of each edge of the tetrahedron case 101 to the length of each of the front edges 140*a*, the side edges 104*b* the rear edges 140*c* and the fold lines 140*d* is 1:0.2154, 1:0.3908, 1:0.3908 and 1:0.3333, respectively. The T-tetra 80 also includes a second T-pentahedron 86, a third T-pentahedron 87, a fourth T-pentahedron 88, a fifth T-pentahedron 89, a sixth T-pentahedron 90, a seventh T-pentahedron 91, an eighth T-pentahedron 92, a ninth T-pentahedron 93, a tenth T-pentahedron 94, an eleventh T-pentahedron 95 and a twelfth T-pentahedron 96, each of which has the same configuration and dimensions as the first T-pentahedron 85 described above with respect to FIG. 7*c*.

Referring again to FIGS. 1–3 and particularly to FIG. 7 of the drawings, at an advanced level of difficulty in assembling the truncated tetra 80 in a fourth tetrahedron case 101 and according to one of several possible methods, the first T-tripyramid 81 is initially placed in the case interior 105 at a vertex 101*a* thereof with the green first face 81*a* abutting against the left wall 102, the green bottom or second face 81*b* resting on the bottom wall 104 and the green third face 81*c* abutting against the right wall 103 of the tetrahedron case 101. The first T-pentahedron 85 is next fitted in the case interior 105, in bordering relationship to the first T-pyramid 81, with the red bottom or first face 85*a* resting on the bottom wall 104 of the tetrahedron case 101. The second T-pentahedron 86 is then placed in the case interior 105, with the blue first face 86*a* resting on the bottom wall 104 of the

tetrahedron case **101** and the green second face **86***b* abutting against the green second face **85***b* of the first T-pentahedron **85**. The third T-pentahedron **87** is then placed in the case interior **105**, with the yellow bottom or first face **87***a* resting on the bottom wall **104** of the tetrahedron case **101**, the green second face **87***b* abutting against the green third face **86***c* of the second T-pentahedron **86** and the green third face **87***c* abutting against the green third face **85***c* of the first T-pentahedron **85**. The first T-tetrahedron **97** is next placed in the case interior **105**, with the green first face **97***a* abutting against the green fourth face **81***d* of the first T-tripyramid **81** and the yellow second face **97***b* resting on the yellow fourth face **85***d* of the first T-pentahedron **85**. The fourth T-pentahedron **88** is next placed in the case interior **105**, with the yellow first face **88***a* abutting against the left wall **102** of the tetrahedron case **101**. The red second face **88***b* abuts against the red fourth face **87***d* of the third T-pentahedron **87** and the blue third face **88***c* rests against the blue third face **97***c* of the first T-tetrahedron **97**. The fifth T-pentahedron **89** is then placed in the case interior **105**, with the blue first face **89***a* resting against the right wall **103** of the tetrahedron case **101** and the red second face **89***b* resting against the red fourth face **97***d* of the first T-tetrahedron **97**. The second T-tripyramid **82** is fitted in the case interior **105** at another vertex **101***a* thereof, with the green first face **82***a* facing the case door **106**, the green second face **82***b* abutting against the left wall **102** and the green bottom or third face **82***c* resting on the bottom wall **104** of the tetrahedron case **101**. The second T-tetrahedron **98** is next placed in the case interior **105**, with the green first face **98***a* abutting against the green fourth face **82***d* of the second T-tripyramid **82** and the blue second face **98***b* resting on the blue fifth face **87***e* of the third T-pentahedron **87**. The sixth T-pentahedron **90** is then placed in the case interior **105**, with the red first face **90***a* abutting against the left wall **102** of the tetrahedron case **101**. The yellow second face **90***b* rests against the yellow third face **98***c* of the second T-tetrahedron **98** and the green third face **90***c* abuts against the green fourth face **88***d* of the fourth T-pentahedron **88**. The third T-tripyrarnid **83** is then placed in the case interior **105** at another vertex **101***a* thereof with the green first face **83***a* facing the case door **106**, the green second face **83***b* abutting against the right wall **103** and the green bottom or third face **83***c* resting on the bottom wall **104** of the tetrahedron case **101**. The third T-tetrahedron **99** is next placed in the case interior **105**, with the green first face **99***a* resting against the green fourth face **83***d* of the third T-tripyramid **83** and the red second face **99***b* resting on the red fourth face **86***d* of the second pentahedron **86**. The seventh T-pentahedron **91** is next placed inside the case interior **105**, with the red first face **91***a* resting abutting against the right wall **103** of the tetrahedron case **101**. The yellow second face **91***b* rests against the yellow third face **99***b* of the third T-tetrahedron **99**, the blue third face **91***e*, against the blue fifth face **85***e* of the first T-pentahedron **85** and the green fourth face **91***c*, against the green third face **89***b* of the fifth T-pentahedron **89**. The eighth T-pentahedron **92** is next placed in the case interior **105**, with the blue first face **92***a* abutting against the left wall **102** of the tetrahedron case **101**. The green second face **92***b* rests against the green fourth face **90***c* of the sixth T-pentahedron **90**, the green third face **92***c* rests on the green fifth face **88***b* of the fourth T-pentahedron **88** and the yellow fourth face **92***e* abuts against the yellow fifth face **89***e* of the fifth T-pentahedron **89**. The ninth T-pentahedron **93** is then placed in the case interior **105**, with the yellow first face **93***a* abutting against the right wall **103** of the tetrahedron case **101**. The green second face **93***b* rests on the green fourth face **89***c* of the fifth T-pentahedron **89** and the green third face **93***c* rests on the green fifth face **91***b* of the seventh T-pentahedron **91**. The tenth T-pentahedron **94** is next placed in the case interior **105**, with the blue first face **94***a* facing the case door **106** of the tetrahedron case **101**. The red second face **94***d* abuts against the red fourth face **98***d* of the second T-tetrahedron **98** and the yellow third face **94***e*, against the yellow fifth face **86***e* of the second T-pentahedron **86**. The eleventh T-pentahedron **95** is next placed in the case interior **105**, with the yellow first face **95***a* facing the case door **106** of the tetrahedron case **101**. The blue second face **95***d* abuts against the blue fourth face **99***c* of the third T-tetrahedron **99**, the red third face **95***e* against the red fourth face **93***e* of the seventh T-pentahedron **93** and the green fourth face **95***b* against the green fourth face **94***c* of the tenth T-pentahedron **94**. The twelfth pentahedron **96** is next placed in the case interior **105**, with the red first face **96***a* facing the case door **106** of the tetrahedron case **101**. The blue second face **96***e* abuts against the blue fifth face **90***e* of the sixth T-pentahedron **90**, the green third face **96***b* against the green fifth face **95***c* of the eleventh T-pentahedron **95** and the green fourth face **96***c* against the green fifth face **94***b* of the tenth T-pentahedron **94**. The inverted, fourth T-tetrahedron **100** is next placed in the case interior **105**, with the blue first face **100***c* resting against the blue fifth face **93***d* of the ninth T-pentahedron **93**, the yellow second face **100***b*, against the yellow fifth face **96***d* of the twelfth T-pentahedron **96** and the red third face **100***d* against the red fifth face **92***d* of the eighth T-pentahedron **92**. Finally, to complete assembly of the truncated tetra **80** in the tetrahedron case **101**, the fourth T-tripyramid **84** is fitted in the remaining space in the case interior **105** at the remaining vertex **101***a* thereof with the green first face **84***a* facing the case door **106**, the green second face **84***b* abutting against the left wall **102** and the green third face **84***c* against the right wall **103** of the tetrahedron case **101**. The green bottom or fourth face **84***d* rests on the green top or fourth face **100***a* of the fourth T-tetrahedron **100**.

As illustrated in FIGS. **1** and **2** of the drawings, when the polyhedron blocks are assembled in the truncated tetra **80** according to the foregoing description, each vertex of the truncated tetra **80** formed by the first, second, third and fourth T-tripyramids, respectively, is green in color. Furthermore, the faces of the three T-pentahedra on each face of the truncated small tetrahedron are red, yellow and blue, respectively. For example, on the front face **80***a* of the truncated tetra **80** corresponding to the case door **106** of the tetrahedron case **101**, the first face **94***a* of the tenth T-pentahedron **94***a* is blue, the first face **95***a*; of the eleventh T-pentahedron **95** is yellow and the first face **96***a* of the twelfth pentahedron **96** is red. As described above with respect to the octahedron **3**, the dual tetra **30**, the icosa tetra **43** and the cubocta tetra **63**, at an intermediate level of difficulty in assembling the truncated tetra **80**, the polyhedron blocks are assembled in the tetrahedron case **101** to form the above-described, four-color pattern on each face of the truncated tetra **80**, but without regard to matching colors of abutting faces of adjacent polyhedron blocks. At an elementary level of difficulty in assembling the truncated tetra **80**, the polyhedron blocks are assembled in the tetrahedron case **101** without regard to matching colors of abutting surfaces on adjacent polyhedron blocks or formation of the above-described color pattern formation on each face of the truncated tetra **80**. It is understood that each color on the respective faces of each polyhedron blocks can be substituted by a color other than those described above, with the same color on different faces substituted by the same

color. As described above with respect to the octahedron **3**, the dual tetra **30**, the icosa tetra **43** and the cubocta tetra **63**, such color substitution would provide the same degree of difficulty in assembling the truncated tetra **80**, as well as the prescribed color pattern formation on each face of the truncated tetra **80**, when the truncated tetra **80** is assembled according to the advanced level of difficulty described above.

It will be appreciated by those skilled in the art that the above descriptions of assembling the octahedron **3**, dual tetra **30**, icosa tetra **43**, cubocta tetra **63** and truncated tetra **80**, respectively, according to the advanced level of difficulty, represents only one of several possible solutions to solving the puzzles **1**. Assembly of each of the octohedron **3** or tetrahedra according to the advanced level of difficulty and formation of the prescribed color pattern on the respective faces of the octahedron **3** or tetrahedron, can be accomplished by any method of placing the constituent polyhedron blocks in the respective octahedron case **108** or tetrahedron case **101**, in the same orientations described above, and in which abutting faces of adjacent polyhedron blocks match in color. It will be further appreciated by those skilled in the art that the polyhedron blocks of the octahedron **3** or each of the tetrahedra can be constructed from wood, molded plastic or any other lightweight, durable material, according to the knowledge of those skilled in the art.

While the preferred embodiments of the invention have been described above, it will be recognized and understood that various modifications may be made in the invention and the appended claims are intended to cover all such modifications which may fall within the spirit and scope of the invention.

Having described my invention with the particularity set forth above, what is claimed is:

1. A multi-polyhedral puzzle conprising an octahedron having eight octahedron faces, said octahedron comprising an octahedron set of polyhedron blocks including a central cube inscribed in said octahedron, said central cube having eight block corners, whereby said block corners of said central cube meet said eight octahedron faces, respectively; and each of said octahedron set of polyhedron blocks having a plurality of block faces each having one of a purality of colors, wherein block faces of each of said polyhedron blocks are disposed in flcing relationship to block faces of adjacent ones of said polyhedron blocks to define said octahedron and said block faces disposed in facing relationship define a pair of block faces on respective adjacent ones of said polyhedron blocks, and said pair of block faces can selectively be matched in color to define a prescribed color pattern on each of said eight octahedron faces of said octahedron.

2. The multi-polyhedral puzzle of claim **1** wherein said octahedron set of polyhedron blocks further comprises:

(a). a first irregular tetrahedron;

(b). a second irregular tetrahedron provided in bordering relationship to said first irregular tetrahedron;

(c). a third irregular tetrahedron provided in bordering relationship to said second irregular tetrahedron;

(d). a fourth irregular tetrahedron provided in bordering relationship to said first irregular tetrahedron and said third irregular tetrahedron;

(e). a bottom tetrapyramid cradled in inverted position between said first irregular tetrahedron, said second irregular tetrahedron, said third irregular tetrahedron and said fourth irregulr tetrahedron, with block faces of said bottom tetrapyramid disposed in facing relationship to block ices of said first, second, third and fourth irregular tetrahedra, respectively;

(f). a fifth irregular tetrahedron provided in bordering relationship with said third irregular tetrahedron and said fourth irregular tetrahedron;

(g). a left rear tetrapyramid provided above said fourth irregular tetrahedron and adjacent to said fifth irregular tetrahedron, with block faces of said left rear tetrapyramid disposed in facing relationship to block faces of said fourth irregular tetrahedron and said fifth irregular tetrahedron, respectively;

(h). a right rear tetrapyramid provided above said third irregular tetrahedron and adjacent to said fifth irregular tetrahedron, opposite said left rear tetrapyramid, with block faces of said right rear tetrapyramid disposed in facing relationship to block faces of said third irregular tetrahedron and said fifth irregular tetrahedron, respectively, and with block faces of said central cube disposed in facing relationship to block faces of said left rear tetrapyramid and said right rear tetrapymid, respectively;

(i). a sixth irregular tetrahedron provided in bordering relationship to said first irregular tetrahedron and said fourth irregular tetrahedron, with a block face of said sixth irregular tetrahedron disposed in facing relationship to a block face of said left rear tetrapyramid;

(j). a seventh irregular tetrahedron provided in bordering relationship to said second irregular tetrahedron and said third irregular tetrahedron, with a block face of said seventh irregular tetrahedron disposed in facing relationship to a block face of said right rear tetrapyramid;

(k). a left front tetrapyramid provided above said first irregular tetrahedron, with block faces of said left front tetrapyramid disposed in facing relationship to block faces of said first irregular tetrahedron, said sixth irregular tetrahedron and said octahedron cube;

(l). a right front tetrapyramid provided above said second irregular tetrahedron, with block faces of said right front tetrapyramid disposed in facing relationship to block faces of said second irregular tetrahedron, said seventh irregular tetrahedron and said octahedron cube;

(m). an eighth irregular tetrahedron provided in bordering relationship to said first irregular tetrahedron and said second irregular tetrahedron, with block faces of said eighth irregular tetrahedron disposed in facing relationship to block faces of said left front tetrapyramid and said right front tetrapyramid, respectively;

(n). a ninth irregular tetrahedron provided above said left rear tetrapyramid and in bordering relationship to said fifth irregular tetrahedron and said sixth irregular tetrahedron, with a block face of said ninth irregular tetrahedron disposed in facing relationship to a block face of said left rear tetrapyramid;

(o). a tenth irregular tetrahedron provided above said right rear tetrapyramid and in bordering relationship to said fifth irregular tetrahedron, said seventh irregular tetrahedron and said ninth irregular tetrahedron, with a block face of said tenth irregular tetrahedron disposed in facing relationship to a block face of said right rear tetrapyramid;

(p). a top tetrapyramid provided above said central octahedron cube, with block faces of said top tetrapyramid disposed in facing relationship to block faces of said octahedron cube, said ninth irregular tetrahedron and said tenth irregular tetrahedron, respectively;

(q). an eleventh irregular tetrahedron provided in bordering relationship to said seventh irregular tetrahedron, said eighth irregular tetrahedron and said tenth irregular tetrahedron, with block faces of said eleventh irregular tetrahedron disposed in facing relationship to block faces of said top tetrapyramid and said right front tetrapyramid, respectively; and

(r). a twelfth irregular tetrahedron provided in bordering relationship to said sixth irregular tetrahedron, said eighth irregular tetrahedron, said ninth irregular tetrahedron and said eleventh irregular tetrahedron, with block faces of said twelfth irregular tetrahedron disposed in facing relationship to block faces of said top tetrapyramid and said left front tetrapyramid, respectively.

3. A multi-polyhedral puzzle comprising a tetrahedron having four tetrahedron faces and four vertices, said tetrahedron comprising a tetrahedron set of polyhedron blocks including a regular tetrahedron inscribed in said tetrahedron, said regular tetrahedron having four regular tetrahedron vertices, whereby said regular tetrahedron vertices meet said four tetrahedron faces, respectively, of said tetrahedron; and each of said tetrahedron set of polyhedron blocks having a plurality of block faces each having one of a plurality of colors, wherein block faces of each of said polyhedron blocks are disposed in facing relationship to block faces of adjacent ones of said polyhedron blocks to define said tetrahedron and said block faces disposed in facing relationship define a pair of block faces on respective adjacent ones of said polyhedron blocks, and said pair of block faces can selectively be matched in color to define a prescribed color pattern on each of said four tetrahedron faces of said tetrahedron.

4. The multi-polyhedral puzzle of claim **3** wherein said tetrahedron set of polyhedron blocks comprises:

(a). a first irregular, large tetrahedron;

(b). a second irregular, large tetrahedron provided in contiguous relationship to said first irregular, large tetrahedron;

(c). a rear tripyramid fitted between said first irregular, large tetrahedron and said second irregular, large tetrahedron, with block faces of said rear tripyramid disposed in facing relationship to block faces of said first irregular, large tetrahedron and said second irregular, large tetrahedron, respectively;

(d). a third irregular, large tetrahedron provided above said rear tripyramid, with a block face of said third irregular, large tetrahedron disposed in ficing relationship to a block face of said rear tripyramid;

(e). a fourth irregular, large tetrahedron provided between said first irregular, large tetrahedron and said second irregular, large tetrahedron;

(f). a left tripyramid provided between said first irregular, large tetrahedron and said fourth irregular, large tetrahedron, with block faces of said left tripyramid disposed in facing relationship to block faces of said first irregular, large tetrahedron and said fourth irregular, large tetrahedron, respectively;

(g). a right tripyramid provided between said second irregular, large tetrahedron and said fourth irregular, large tetrahedron, with block faces of said right tripyramid disposed in facing relationship to block faces of said second irregular, large tetrahedron and said fourth irregular, large tetrahedron, respectively, and with said regular tetrahedron fitted between said left tripyramid and said right tripyramid and block faces of said regular tetrahedron disposed in facing relationship to block faces of said rear tripyramid, said left tripyramid and said right tripyramid, respectively;

(h). a top tripyramid provided above said regular tetrahedron, with block ices of said top tripyramid disposed in facing relationship to block faces of said regular tetrahedron and said third irregular, large tetrahedron, respectively;

(i). a fifth irregular, large tetradron fitted adjacent to said fourth irregular, large tetrahedron, with block faces of said fifth irregular, large tetrahedron disposed in facing relationship to block faces of said top tripyramid and said left tripyramid, respectively; and

(j). a sixth irregular, large tetrahedron fitted adjacent to said fifth irregular, large tetrahedron, with block faces of said sixth irregular, large tetrahedron disposed in facing relationship to block faces of said top tripyramid and said right tripyramid, respectively.

5. A multi-polyhedral puzzle comprising a tetrahedron having four tetrahedron faces and four vertices, said tetrahedron comprising a tetrahedron set of polyhedron blocks, each of said tetrahron set of polyhedron blocks having a plurality of block faces each having one of a plurality of colors, wherein block faces of each of said polyhedron blocks are disposed in facing relationship to block faces of adjacent ones of said polyhedron blocks to define said tetrahedron and said block faces disposed in facing relationship define a pair of block faces on respective adjacent ones of said polyhedron blocks, and said pair of block faces can selectively be matched in color to define a prescribed color pattern on each of said four tetrahedron faces of said tetrahedron; and wherein said tetrahedron set of polyhedron blocks includes an icosahedron inscribed in said tetrahedron, whereby four block faces of said icosahedron appear on said four tetrahedron faces, respectively, of said tetrahedron.

6. The multi-polyhedral puzzle of claim **5** wherein said tetrahedron set of polyhedron blocks comprises:

(a). a first large tetrahedron;

(b). a second large tetrahedron provided in said tetrahedron in spaced relationship to said first large tetrahedron;

(c). a first icosa pyramid fitted in said tetrahedron, with a block face of said first icosa pyramid disposed in facing relationship to a block face of said second large tetrahedron;

(d). a first small tetrahedron provided adjacent to said first icosa pyramid, with block faces of said first small tetrahedron disposed in facing relationship to block faces of said first icosa pyramid and said first large tetrahedron, respectively;

(e). a third large tetrahedron provided above said first icosa pyramid, with a block face of said third large tetrahedron disposed in facing relationship to a block face of said first icosa pyramid;

(f). a second small tetrahedron provided adjacent to said second large tetrahedron, with a block face of said second small tetrahedron disposed in facing relationship to a block face of said second large tetrahedron and block faces of said icosahedron disposed in facing relationship to block faces of said first small tetrahedron, said icosa pyramid, said second large tetrahedron, said second small tetrahedron and said first large tetrahedron, respectively;

(g). a second icosa pyramid fitted between said first large tetrahedron and said icosahedron, with block faces of

said second icosa pyramid disposed in facing relationship to block faces of said icosahedron and said first large tetrahedron, respectively,

(h). a fourth large tetrahedron fitted in said tetrahedron, with a block face of said fourth large tetrahedron disposed in facing relationship to a block face of said icosahedron;

(i). a third icosa pyramid provided between said second small tetrahedron and said icosahedron, with block faces of said third icosa pyramid disposed in facing relationship to said block faces of said icosahedron, said second small tetrahedron and said fourth large tetrahedron, respectively;

(j). a third small tetrahedron fitted between said second icosa pyramid and said fourth large tetrahedron, with said block faces of said third small tetrahedron disposed in facing relationship to block faces of said second icosa pyramid, said icosahedron and said fourth large tetrahedron, respectively;

(k). a fifth large tetrahedron fitted in said tetrahedron, with a block face of said fifth large tetrahedron disposed in facing relationship to a block face of said icosahedron;

(l). a fourth small tetrahedron provided between said icosahedron and said third icosa pyramid, with block faces of said fourth small tetrahedron disposed in facing relationship to block faces of said icosahedron, said third icosa pyramid and said fifth large tetrahedron, respectively;

(m). a fifth small tetrahedron fitted between said third large tetrahedron and said icosahedron, with block faces of said fifth small tetrahedron disposed in facing relationship to block faces of said icosahedron and said third large tetrahedron, respectively;

(n). a fourth icosa pyramid provided between said fifth large tetrahedron and said icosahedron, with block faces of said fourth icosa pyramid disposed in facing relationship to block faces of said icosahedron, said fifth large tetrahedron and said fifth small tetrahedron, respectively;

(o). a sixth large tetrahedron provided in said tetrahedron, with block faces of said sixth large tetrahedron disposed in acing relationship to block fiaces of said second icosa pyramid and said icosahedron, respectively; and

(p). a sixth small tetdron fitted between said sixth large tetrahedron and said icosahedron, with block faces of said sixth small tetrahedron disposed in facing relationship to block faces of said fourth icosapyramid, said icosahedron and said sixth large tetrahedron, respectively.

7. A multi-polyhedral puzzle comprising a tetrahedron having four tetrahedron faces and four vertices, said tetrahedron conpising a tetrahedron set of polyhedron blocks, each of said tetrahedron set of polyhedron blocks having a plurality of block faces each having one of a plurality of colors, wherein block faces of each of said polyhedron blocks are disposed in facing relationship to block faces of adjacent ones of said polyhedron blocks to define said tetrahedron and said block faces disposed in facing relationship define a pair of block faces on respective adjacent ones of said polyhedron blocks, and said pair of block faces can selectively be matched in color to define a prescribed color pattern on each of said four tetrahedron faces of said tetrahedron; and wherein said tetrahedron set of polyhedron blocks includes a cuboctahedron inscribed in said tetrahedron, whereby four block faces of said cuboctahedron appear on said four tetrahedron faces, respectively, of said tetrahedron.

8. The multi-polyhedral puzzle of claim **7** wherein said tetrahedron set of polyhedron blocks comprises:

(a). a first pentahedron provided in said tetrahedron at a first vertex of said tetrahedron;

(b). a second pentahedron provided adjacent to said first pentahedron, with a block face of said second pentahedron disposed in facing relationship to a block face of said first pentahedron;

(c). a first square pyramid fitted adjacent to said second pentahedron, with a block face of said first square pyramid disposed in facing relationship to a block face of said second pentahedron;

(d). a second square pyramid provided adjacent to said first pentahedron, with a block face of said second square pyramid disposed in facing relationship to a block fice of said first pentahedron and block faces of said cuboctahedron disposed in facing relationship to block faces of said second pentahedron, said first square pyramid and said second square pyramid, respectively;

(e). a third square pyramid provided adjacent to said cuboctahedron, with block faces of said third square pyramid disposed in facing relationship to block faces of said cuboctahedron and said second pentahedron, respectively;

(f). a third pentahedron fitted in said tetrahedron at a second vertex of said tetrahedron;

(g). a fourth pentahedron provided adjacent to said third pentahedron, with a block face of said fourth pentahedron disposed in facing relationship to a block face of said third pentahedron, and a block face of said fourth pentahedron disposed in facing relationship to block faces of said cuboctahedron and said first square pyramid;

(h). a fourth square pyramid fitted between said fourth pentahedron and said cuboctahedron, with block faces of said fourth square pyramid disposed in facing relationship to block faces of said cuboctahedron and said fourth pentahedron, respectively;

(i). a fifth square pyramid fitted between said fourth pentahedron and said cuboctahedron, with block faces of said fifth square pyramid disposed in facing relationship to block faces of said third pentahedron and said cuboctahedron, respectively;

(j). a fifth pentahedron provided in said tetrahedron at a third vertex of said tetrahedron, with a block face of said fifth pentahedron disposed in facing relationship to block faces of said fifth square pyramid, said cuboctahedron and said second square pyramid;

(k). a sixth pentahedron provided adjacent to said fifth pentahedron, with a block face of said sixth pentahedron disposed in facing relationship to a block face of said fifth pentahedron;

(l). a sixth square pyramid fitted between said sixth pentahedron and said cuboctahedron, with block faces of said sixth square pyramid disposed in facing relationship to block faces of said cuboctahedron and said sixth pentahedron, respectively;

(m). a seventh pentahedron provided above said cuboctahedron, with a block face of said seventh pentaedron disposed in facing relationship to block faces of said sixth square pyramid, said cuboctahedron and said third square pyramid; and

(n). an eighth pentahedron fitted adjacent to said seventh pentahedron at a fourth vertex of said tetrahedron, with

block faces of said eighth pentahedron disposed in facing relationship to block faces of said fourth square pyramid and said seventh pentahedron, respectively.

9. A multi-polyhedral puzzle comprising a tetrahedron having four tetrahedron faces and four vertices, said tetrahedron comprising a tetrahedron set of polyhedron blocks each having a plurality of block faces each having one of a plurality of colors, wherein block faces of each of said polyhedron blocks are disposed in facing relationship to block faces of adjacent ones of said polyhedron blocks to define said tetrahedron, and said block faces disposed in facing relationship define a group of block faces on respective adjacent ones of said polyhedron blocks and said group of block faces can selectively be matched in color to define a prescribed color pattern on each of said four tetrahedron faces, said tetrahedron set of polyhedron blocks comprising:

(a). a first T-tripyramid provided in said tetrahedron at a first vertex of said tetrahedron;

(b). a first T-pentahedron provided in bordering relationship to said first T-tripyramid;

(c). a second T-pentahedron provided in adjacent relationship to said first T-pentahedron, with a block face of said second T-pentahedron disposed in facing relationship to said first T-pentahedron;

(d). a third T-pentahedron provided in adjacent relationship to said second T-pentahedron, with block faces of said third T-pentahedron disposed in facing relationship to block faces of said first T-pentahedron and said second T-pentahedron, respectively;

(e). a first T-tetrahedron provided above said first T-pentahedron, with block faces of said first T-tetrahedron disposed in facing relationship to block faces of said first T-tripyramid and said first T-pentahedron, said first T-tetrahedron inscribed in said tetrahedron, whereby four block faces of said first T-tetrahedron appear on said four tetrahedron faces, respectively, of said tetrahedron;

(f). a fourth T-pentahedron provided adjacent to said third T-pentahedron and said first T-tetrahedron, with block faces of said fourth T-pentahedron disposed in facing relationship to block faces of said third T-pentahedron and said first T-tetrahedron, respectively;

(g). a fifth T-pentahedron provided adjacent to said first T-tetrahedron, opposite said fourth T-pentahedron, with a block face of said fifth T-pentahedron disposed in facing relationship to a block face of said first T-tetrahedron;

(h). a second T-tripyramid fitted in said tetrahedron at a second vertex of said tetrahedron;

(i). a second T-tetrahedron provided adjacent to said second T-tripyramid, with block faces of said second T-tetrahedron disposed in facing relationship to block faces of said second T-tripyramid and said third T-pentahedron, respectively;

(j). a sixth T-pentahedron fitted between said second T-tetrahedron and said fourth T-pentahedron, with block faces of said sixth T-pentahedron disposed in facing relationship to block faces of said second T-tetrahedron and said fourth T-pentahedron, respectively;

(k). a sixth T-pentahedron provided above said fourth T-pentahedron, with block faces of said sixth T-pentahedron disposed in facing relationship to block faces of second T-tetrahedron and said fourth T-pentahedron, respectively;

(l). a third T-tripyramid provided in said tetrahedron at a third vertex of said tetrahedron;

(m). a third T-tetrahedron provided adjacent to said third T-tripyramid, with block faces of said third T-tetrahedron disposed in facing relationship to block faces of said third T-tripyramid and said second pentahedron, respectively;

(n). a seventh T-pentahedron provided adjacent to said third T-tetrahedron, with block faces of said seventh T-pentahedron disposed in facing relationship to block faces of said third T-tetrahedron, said first T-pentahedron and said fifth T-pentahedron, respectively;

(o). an eighth T-pentahedron fitted between said fourth T-pentahedron and said sixth T-pentahedron, with block faces of said eighth T-pentahedron disposed in facing relationship to block faces of said fourth T-pentahedron, said fifth T-pentahedron and said sixth T-pentahedron, respectively;

(p). a ninth T-pentahedron fitted between said fifth T-pentahedron and said seventh T-pentahedron, with block faces of said ninth T-pentahedron disposed in facing relationship to block faces of said fifth T-pentahedron and said seventh T-pentahedron, respectively;

(q). a tenth T-pentahedron provided between said second T-pentahedron and said second T-tetrahedron, with block faces of said tenth T-pentahedron disposed in facing relationship to block faces of said second T-pentahedron and said second T-tetrahedron, respectively;

(r). an eleventh T-pentahedron fitted between said tenth T-pentahedron and said third T-tetrahedron, with block faces of said eleventh T-pentahedron disposed in faicing relationship to block faces of said third T-tetrahedron, said seventh T-pentahedron and said tenth T-pentahedron, respectively;

(s). a twelfth T-pentahedron fitted between said tenth T-pentahedron and said eleventh T-pentahedron, with block flces of said twelfth T-pentahedron disposed in facing relationship to block faces of said sixth T-pentahedron, said tenth T-pentahedron and said eleventh T-pentahedron, respectively,

(t). a fourth T-tetrahedron fitted in inverted position between said eighth T-pentahedron, said ninth T-pentahedron and said twelfth T-pentahedron, with block faces of said fourth T-tetrahedron disposed in facing relationship to block faces of said eighth T-pentahedron, said ninth T-pentahedron and said twelfth T-pentahedron, respectively; and

(u). a fourth T-tripyramid provided in said tetrahedron above said fourth T-tetrahedron and at a fourth vertex of said tetrahedron, with a block face of said fourth T-tripyramid disposed in facing relationship to a block face of said fourth T-tetrahedron.

* * * * *